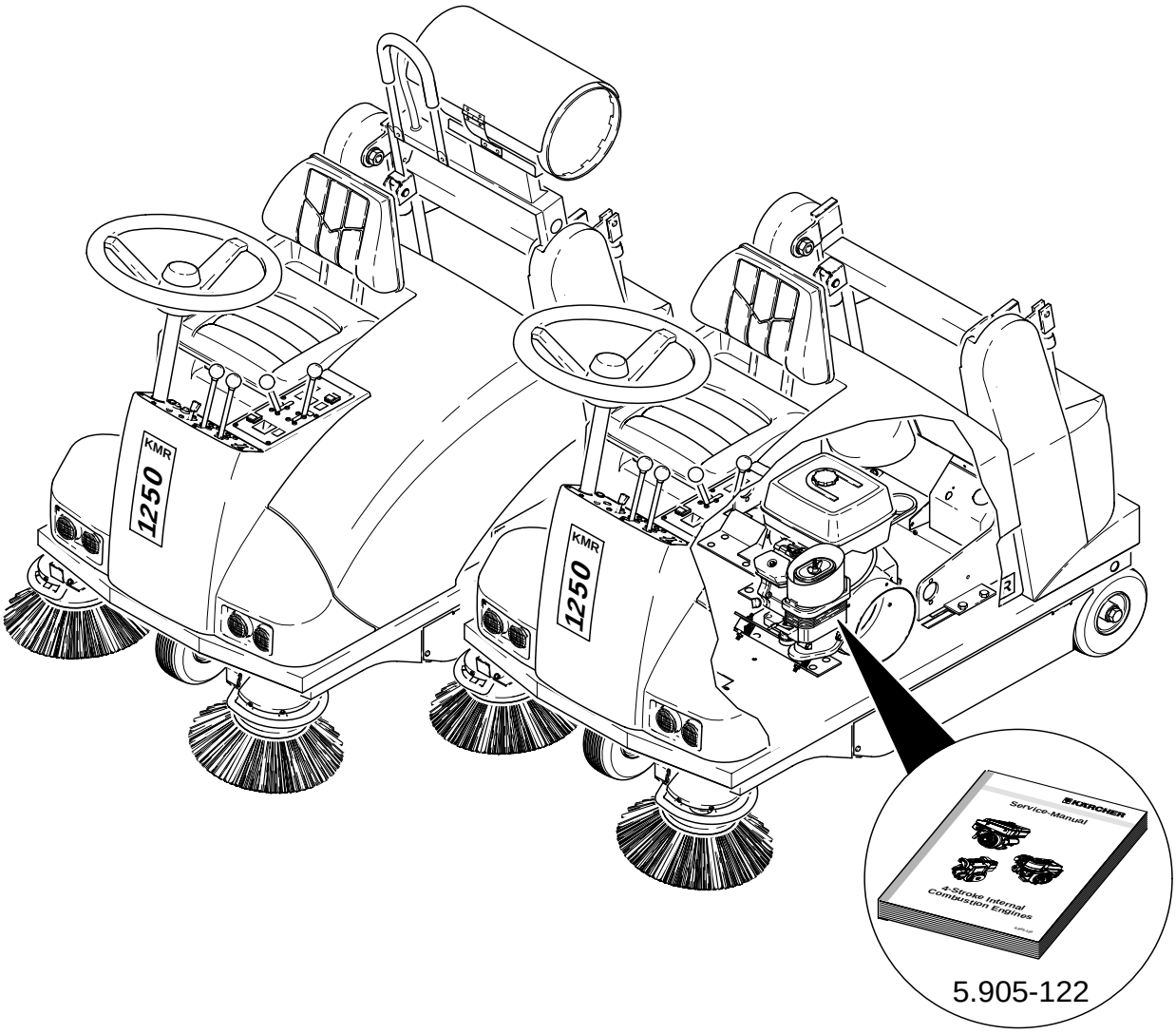
KÄRCHER

Service Manual



KMR 1250

(KMR 1250 B, KMR 1250 LPG, KMR 1250 D)
1.091- . . .

5.905-262
09.02

Foreword

Good servicing requires extensive and relevant training as well as comprehensible reference documents.

We therefore offer basic and advanced training courses for the full range of our products to all service technicians on a regular basis.

In addition, we produce service manuals for the major units in our product line. While these are ideal for initial use as instruction manuals, they are designed to serve as an essential reference in the future.

To augment our product-related communications, we regularly distribute service information bulletins providing details about ongoing product development.

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Drive system

– When the hood is lifted up toward the rear, all components become accessible for maintenance purposes.

– Hydrostatic transmission with mechanical freewheeling device provides variable control of forward and reverse driving speeds.

– Parking brake lever actuates transmission-mounted disc brake.

– No foot brake required. Transmission provides braking effect.

– Transmission, impeller fan, brush roller and side brushes are belt-driven.

– Rear wheels are chain-driven.

– To start engine, driver must occupy operator seat (seat contact switch).

– Discharge of debris container via electrically driven hydraulic unit.

Sweeping system

– Brush roller counter-rotates against direction of unit motion (throw-over principle).

– Debris container is located at rear of brush roller.

– Two-position adjustment of brush roller via control lever:

  Center position: Rigid brush roller suspension for level surfaces.

  Bottom position: Floating brush roller suspension for uneven surfaces.

– Quick-change brush roller replacement. No tools required.

– Side brush automatically extends outward when lowered.

– Coarse-dirt flap accommodates pickup of beverage cans, etc.

– Hydraulic discharge of debris container in raised position (two-hand operation).

Suction and filtering system

– Dust pickup at brush roller.

– Large-capacity dust filter with mechanical dust removal.

– Each time engine is shut off, dust filter is subjected to automatic cleaning cycle of approx. 15-second duration.

– Impeller fan with closeable exhaust-air hatch for wet-sweeping operation.

– Quick-change dust filter replacement. No tools required.

– Impeller fan driven by elastic belt. No tension adjustment required.

Engine KMR 1250 B

– Single-cylinder, air-cooled gasoline engine (HONDA GX 270) w/ electric starter. Uses standard grade unleaded gasoline.

– Engine features oil level sensor.

Engine 1250 LPG

With the exception of the conversion to run on liquefied petroleum gas (LPG), the unit is identical to the basic KMR 1250 B version.

– The gasoline engine is the same as in the KMR 1250 B (HONDA GX 270).

– The LP gas cylinder is mounted behind the driver's seat. As the gasoline tank is disconnected, its use is strictly prohibited.

– The carburetor has been converted to LP gas operation.

– The engine compartment accommodates an additional gas regulator required to adjust the air/fuel mixture for the engine.

– The mechanical choke has been converted to electrical control; it acts upon the gas regulator.

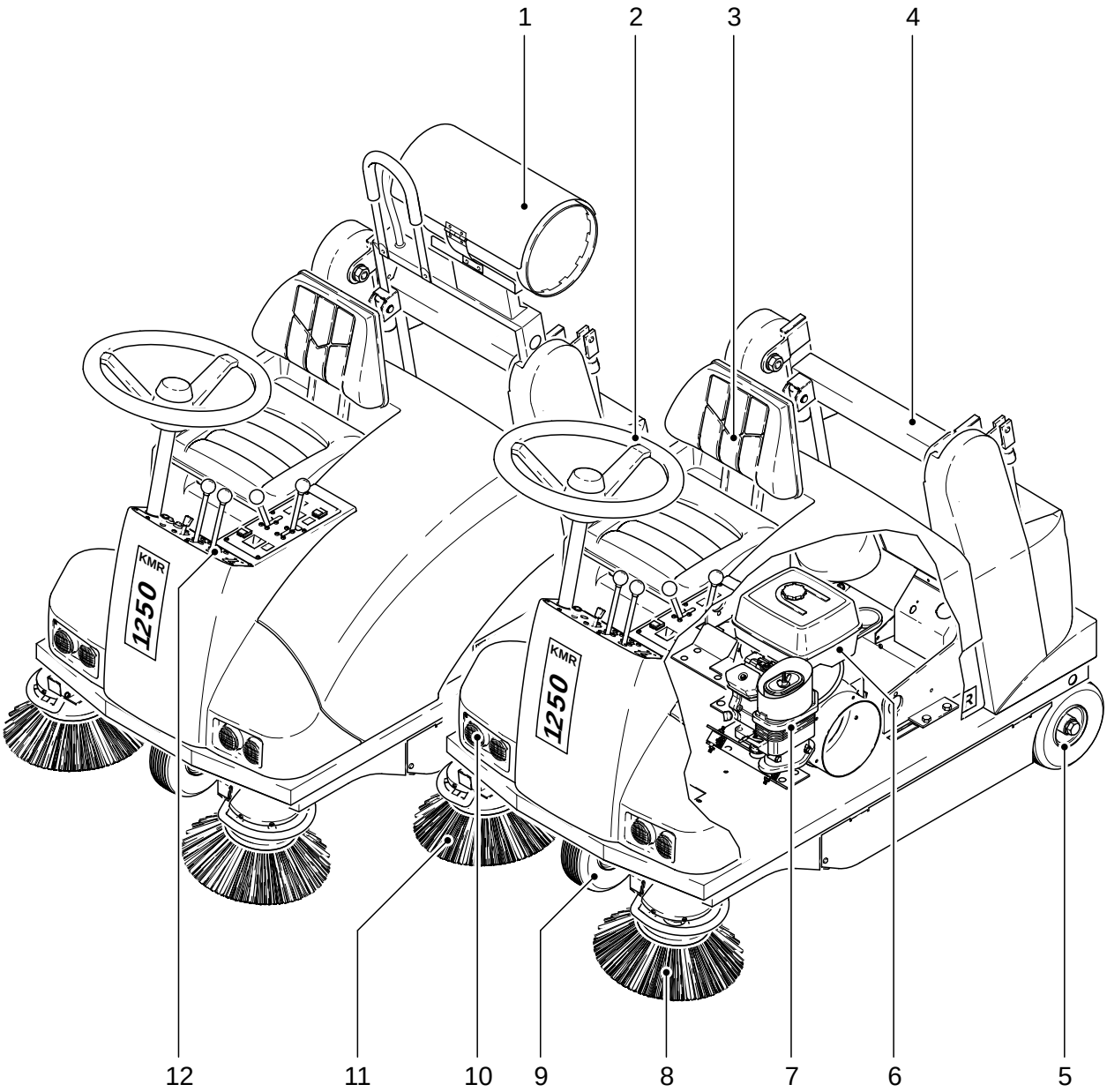
Engine 1250 D

With the exception of the different engine type, the unit is identical to the basic KMR 1250 B version.

– Single-cylinder, air-cooled diesel engine (YANMAR L 70 AE-DE) w/ electric starter.

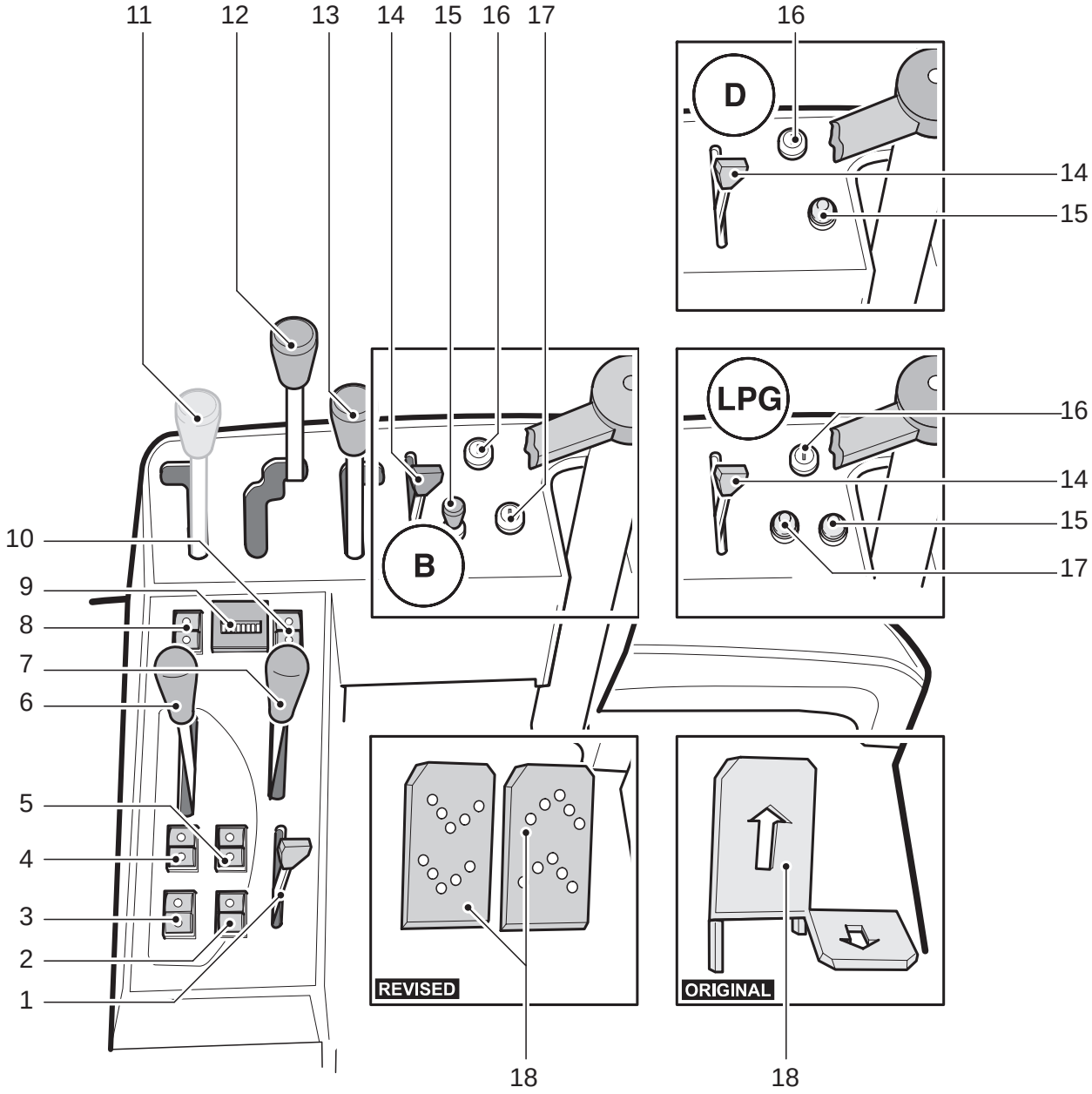
– Features compression release for short-term operation to help overcome top dead center when starting the engine.

View from front



1 Gas cylinder (LP Gas)
2 Steering wheel
3 Driver seat
4 Lifting mechanism for debris container
5 Rear wheel, chain-driven
6 Fuel tank for KMR B / D
7 Engine KMR B / LPG / D
8 LH side brush (option)
9 Front wheel
10 Head lights
11 RH side brush
12 Controls (see page 7)

Controls

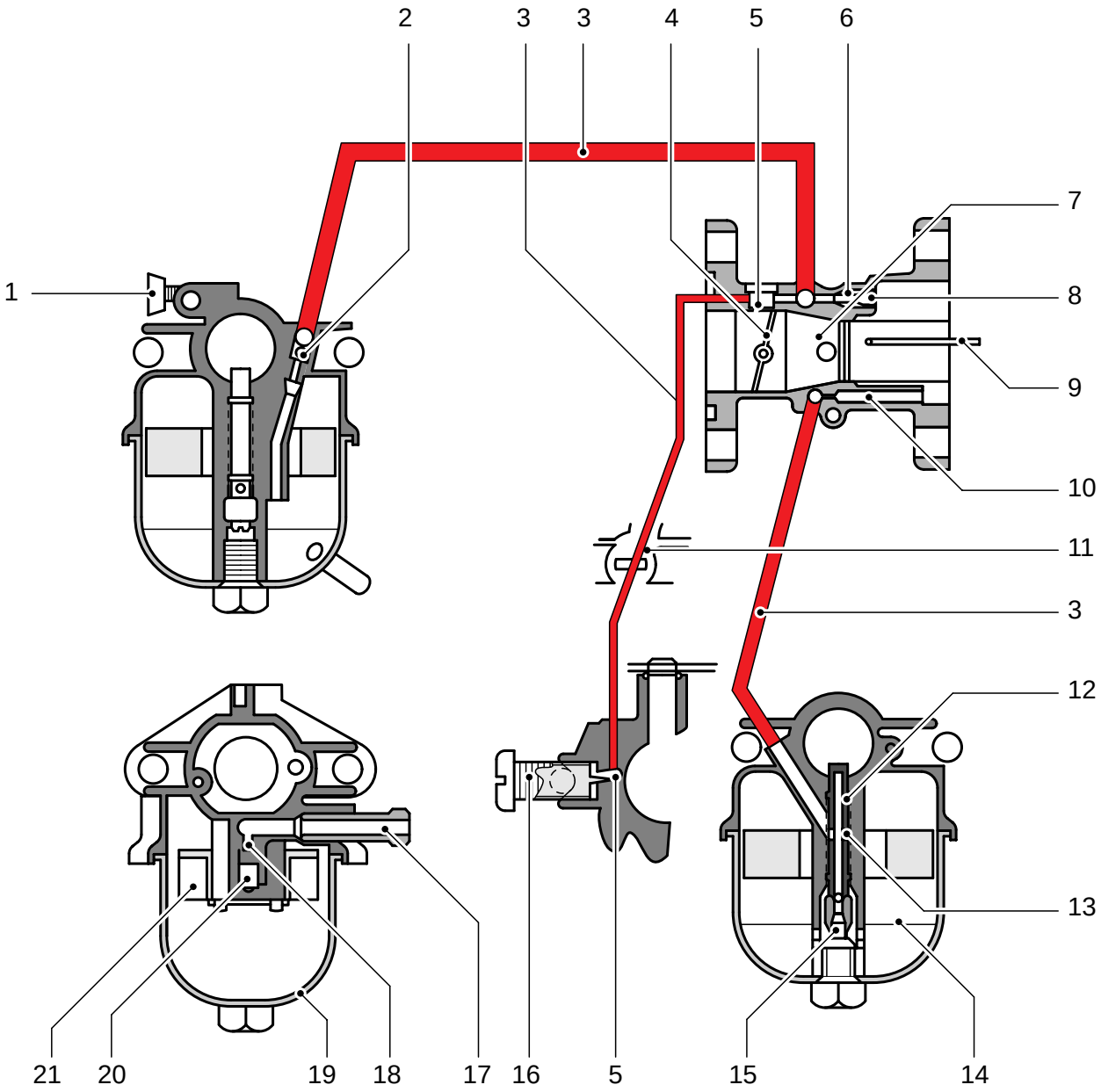


1 Lever dust pickup, Close / Open
2 Button clean dust filter (S2)
3 Button lower debris container (S6)*****
4 Button raise debris container (S8)*****
5 Button tilt debris container (S7)*****
6 Lever parking brake
7 Lever coarse-dirt flap
8 Headlight switch (S4)
9 Operating hours counter
10 Button two-hand operation, hydraulic (S5)
11 Lever LH side brush, Raise / Lower (option)
12 Lever brush roller, Raise / Lower (suspension: rigid or floating)
13 Lever RH side brush, Raise / Lower
14 Throttle lever
15 Button horn (S10)
16 Ignition switch (S1)
17 Choke
18 Drive pedal ORIGINAL and REVISED

*** Function available only in conjunction with two-hand operation button (10).**

( ) See circuit diagram.

Gasoline Engine (HONDA GX 270)



1 Stop screw, throttle valve
2 Idle jet
3 Bypass
4 Throttle valve
5 Idle orifice
6 Idle jet bore and idle air channel
7 Carburetor throat (venturi)
8 Idle air inlet
9 Choke valve
10 Main air jet
11 Idle system
12 Emulsion tube
13 Air orifice
14 Float chamber
15 Main jet
16 Adjusting screw, idle mixture
17 Fuel inlet
18 Inlet, float valve
19 Float
20 Float valve w/ float needle
21 Float

Gasoline Engine (HONDA GX 270)

Float system

When float chamber (14) is empty, fuel passes from fuel tank into float chamber (14) via the float valve inlet (18). The rising fuel level causes the float (21) to be raised.

The inflow of fuel is interrupted when the float (21) causes the float valve to close. Drawing fuel for engine operation from the float chamber (14) causes the float (21) to be lowered, which in turn opens the float valve (18).

This cyclical procedure ensures a constant level of fuel inside the float chamber (14).

Float chamber equalization

On the carburetor side, the airspace inside the float housing is connected with the outside atmosphere by means of a channel. This facilitates the equalization of the pressure equilibrium inside the float chamber as the fuel level rises or falls.

Idling operation

When the engine is idling, the throttle valve (4) is fully closed.

– This causes negative pressure to occur between the throttle (4) and the crown of the engine piston, with the latter moving toward bottom dead center while the intake valve is open.
– The atmospheric pressure inside the float chamber (14) then causes fuel to be conveyed through the main jet (15) and idle jet (2).
– The idle jet (2) controls the flow of fuel through the idle bypass channel (3). The fuel then blends with the air being drawn in through the idle air channel (6).
– The resulting air/fuel mixture then flows into the engine.
– The idle mixture adjusting screw (16) controls the volume of air/fuel mixture that is allowed to flow through the idle orifice (5).

Partial load operation

Engine speed rises when the throttle valve (4) opens, and the volume of the air/fuel mixture being drawn through the idle jet (2) increases.

Full load operation

In full load operation, the throttle is wide (4) open:

– Air flows through the carburetor throat, or venturi (7). Because the diameter of the venturi outlet is smaller than that of the intake, the air is accelerated as it passes through. This increased flow velocity causes negative pressure to occur at the outlet side of the main jet (15).
– Pressure inside the float chamber (14) is equalized via an atmospheric relief channel. Because atmospheric pressure is higher than the pressure in the carburetor throat (7), fuel is transported from the float chamber (14), and pressed through the main jet (15) into the emulsion tube (12).
– The air flowing through the main air jet (10) is blended with the fuel that is flowing through the orifices of the emulsion tube (12).
– This mixture is then drawn into the carburetor throat (7), where it is enriched with more air before passing into the engine.

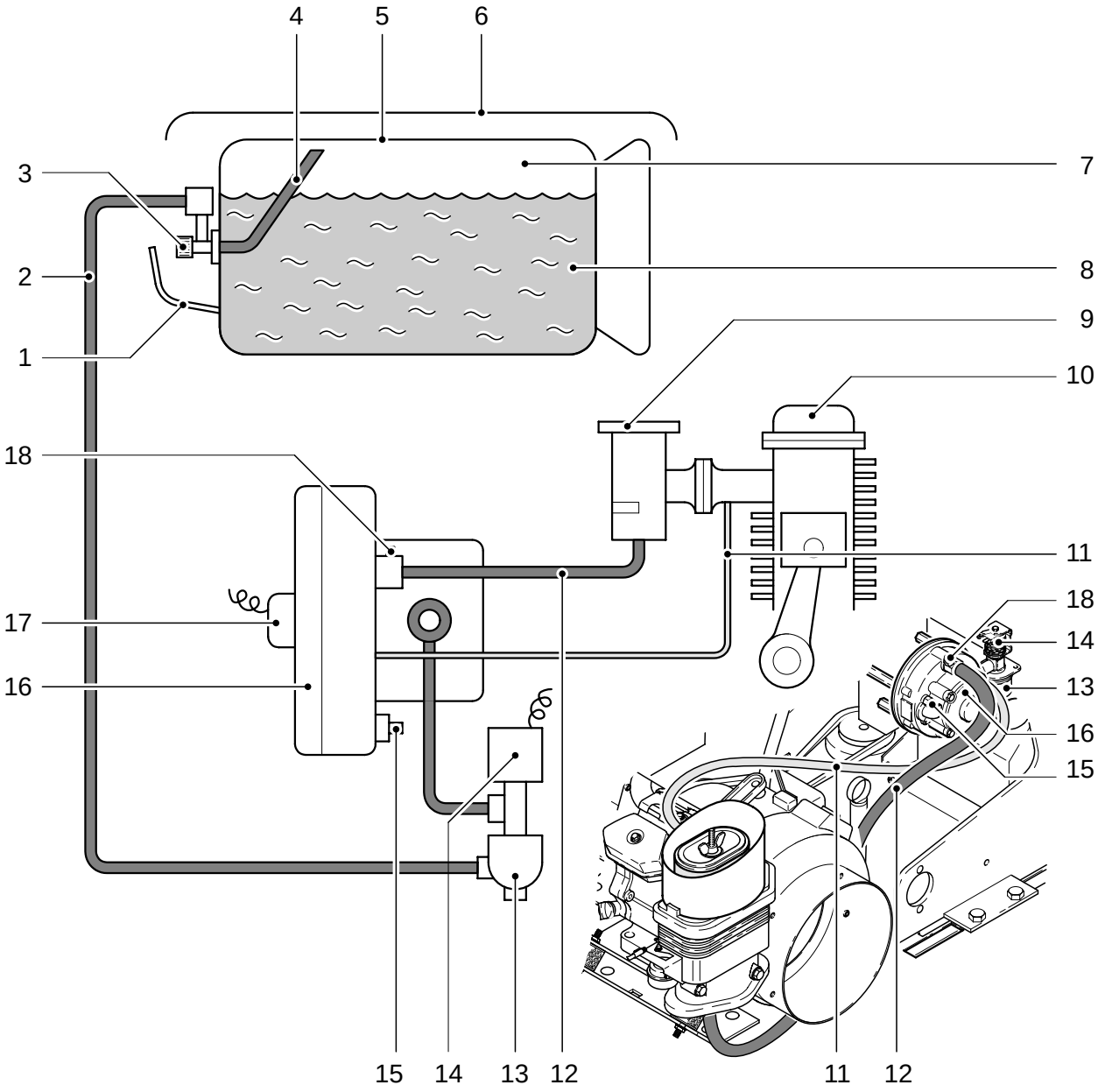
Choke system function

The choke valve (9) should be closed only when starting a cold engine. This causes the following to happen:

– The closed choke valve (9) allows less air to be drawn into the carburetor throat (7).
– However, the fuel volume being drawn in through the main jet (15) remains the same.
– This causes the fuel component in the air/fuel mixture to rise, with the richer mixture providing easier engine starting.

Note:
For information on other maintenance and adjustments of the engine, refer to the Service manual „4-Stroke Internal Combustion Engines“ (5.905-122).

LP Gas Engine (HONDA GX 270)



1	Valve guard	10	Engine
2	LP gas line	11	Vacuum line
3	Cylinder shutoff valve	12	LP gas line
4	Outlet tube	13	Gas filter
5	LP gas cylinder	14	Solenoid valve, gas supply
6	Sun shield	15	Mixture control screw (MIN eng. speed)
7	LP gas in gaseous state	16	Gas regulator
8	LP gas in liquid state	17	Choke lifting solenoid
9	Carburetor	18	Mixture control screw (MAX eng. speed)

LP Gas Engine (HONDA GX 270)

Gas system

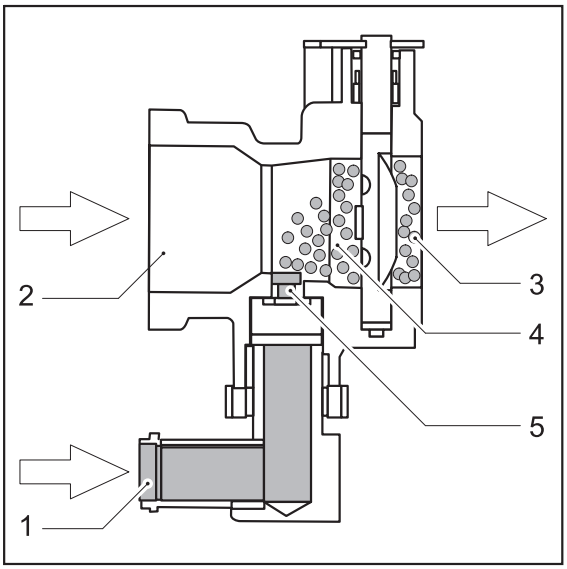
– Opening the shutoff valve (3) on the LP gas cylinder (5) causes gas to flow through the gas filter (13). At this point, possible contaminants are trapped in a paper filter, and metallic particles from gas cylinder are removed by means of a small magnet.

– Setting ignition key to Pos. 1 (ON) opens solenoid valve (14), allowing LP gas to flow from gas filter (13) into primary chamber of gas regulator (16). Here, a spring-loaded valve reduces gas pressure to approximately 150 mbar (2.2 psi).

– When starter begins to crank engine (10), a vacuum is created in the suction channel. Through vacuum line (11), this vacuum acts on low-pressure diaphragm in secondary stage of gas regulator. Diaphragm opens low-pressure valve, and gas can be drawn into engine.

– Pressing choke button causes choke lifting solenoid (17) to open low-pressure valve, allowing gas to flow directly through carburetor and into engine. This function is particularly important in cold-starting situations. To prevent high-level enrichment of intake mixture with LP gas, choke button should not be pressed for longer than 3-5 seconds.

Note:
The connection on cylinder shutoff valve (3) must face straight up (extraction of LP gas in gaseous state).



Carburetor in LP gas operation (example)

– The presence of frost on any part of the LP gas system indicates a possible leak. Close the cylinder shutoff valve (3) immediately. Apply suitable leak detection medium (soapy water or Leak Detecting Spray 6.282-033) to gas lines, solenoid valve, gas regulator and gas hose to carburetor. Open cylinder shutoff valve (3), and check for formation of bubbles. The unit may be returned to service only after thorough repairs have been carried out by approved specialists.

Note:
The LP gas system of the unit must be inspected by a licensed expert in 6-month intervals. The results of each inspection must be made available in the form of a test certificate.

– An expert is deemed to be a person who, based on his professional education and skills, possesses sufficient knowledge of, and expertise in, the field of LP gas systems, and who is sufficiently familiar with applicable working directives and accident prevention regulations, as well as commonly accepted procedures of this technology, all of the above enabling him to evaluate, determine and assess the safe operational state of LP gas systems.

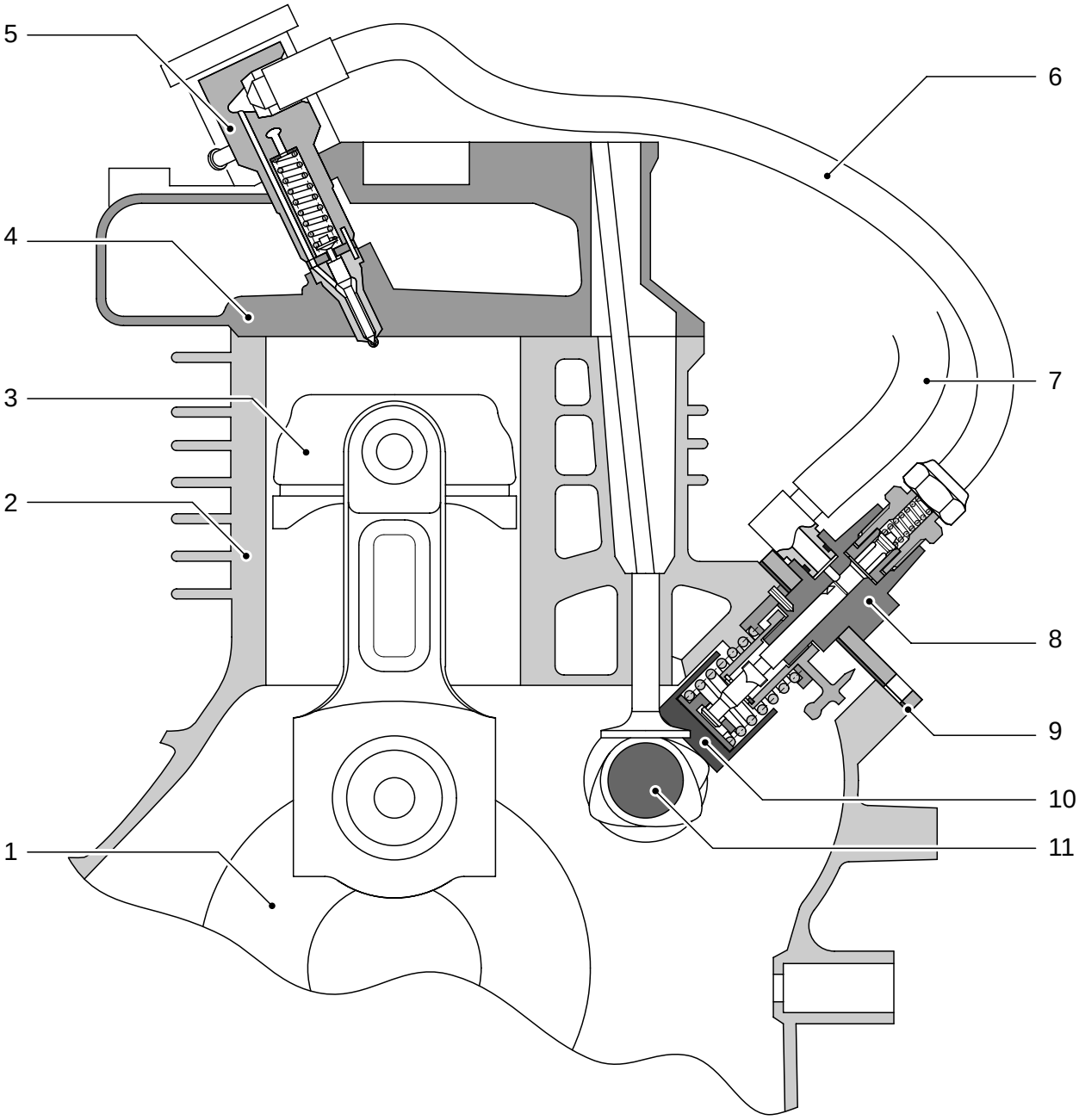
Note:
For information on other maintanance and adjustments of the engine, refer to the Service manual “4-Stroke Internal Combustion Engines” (5.905-122).

Gas regulator

– Engines using LP gas as a fuel are equipped with a gas regulator which feeds LP gas to the carburetor of a gasoline engine. The carburetor generates an air/fuel mixture which is drawn into the combustion chamber for ignition.

1 Gas inlet
2 Air intake
3 Air/fuel mixture outlet
4 Mixing chamber
5 Gas jet

Diesel Engine (YANMAR L 70 AE-DE)



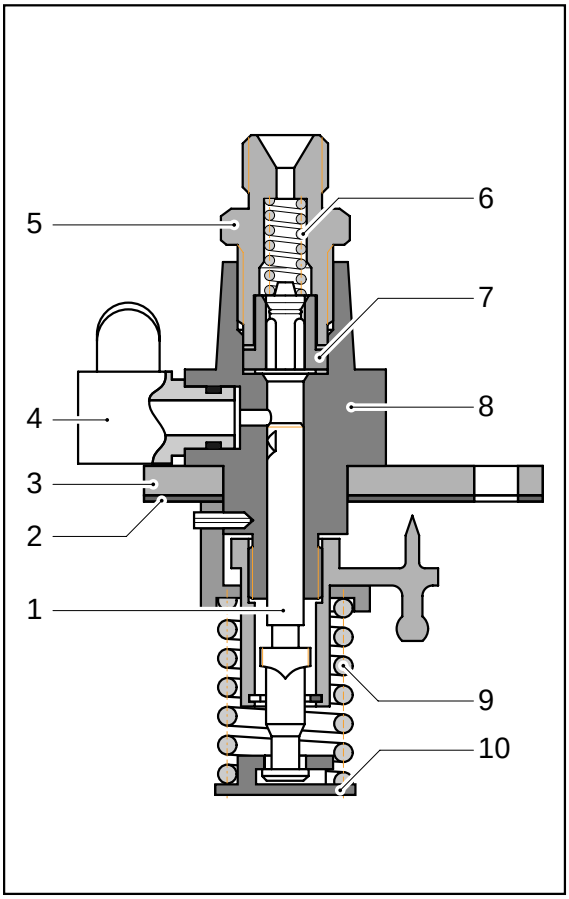
1 Drive shaft
2 Housing, engine
3 Piston
4 Cylinder head
5 Injector
6 Fuel feed line
7 Fuel line from fuel tank
8 Injection pump
9 Shim
10 Housing, injection pump
11 Cam shaft

Injection system

The injection pump (8) delivers fuel to the injector nozzle (5) via fuel line (6). The fuel, is then injected into the combustion chamber above the engine piston (3), where the extreme engine compression causes the fuel to self-ignite.

Note:
For information on other maintenance and adjustments of the engine, refer to the Service manual „4-Stroke Internal Combustion Engines“ (5.905-122).

Diesel Engine (YANMAR L 70 AE-DE)



Injection pump (cross-section)

Injection pump

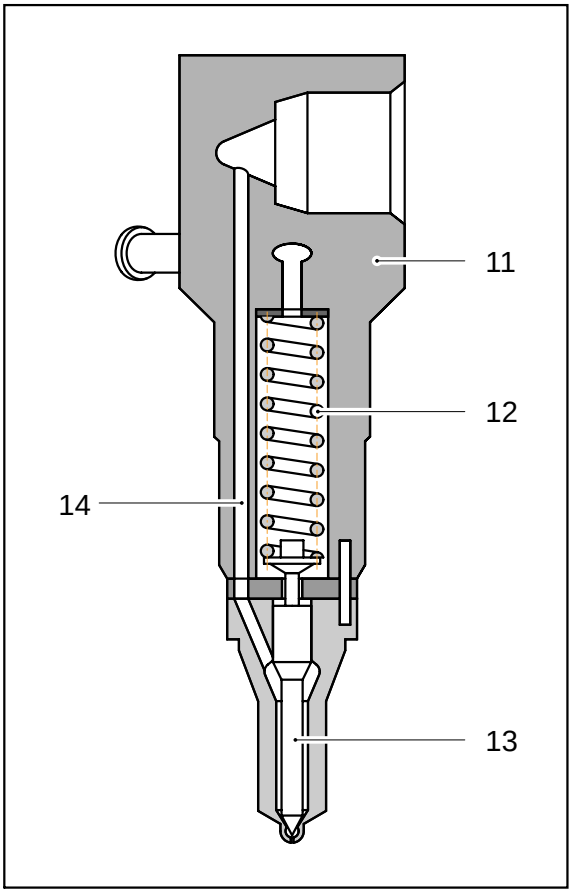
The injection cam on the camshaft shuttles the injection pump piston (1) back and forth. Fuel is conveyed to the injection nozzle via pressure valve (7).

Injection timing is determined by the thickness and number of shims (2) in shim pack.

Note:
Checking injection timing and related fine adjustment are the exclusive domain of a licensed service facility.

In the event that the injection pump fails to deliver fuel, the entire injection pump assembly must be removed and checked.

Note:
Injection pump service and repair are the exclusive domain of a licensed service facility.



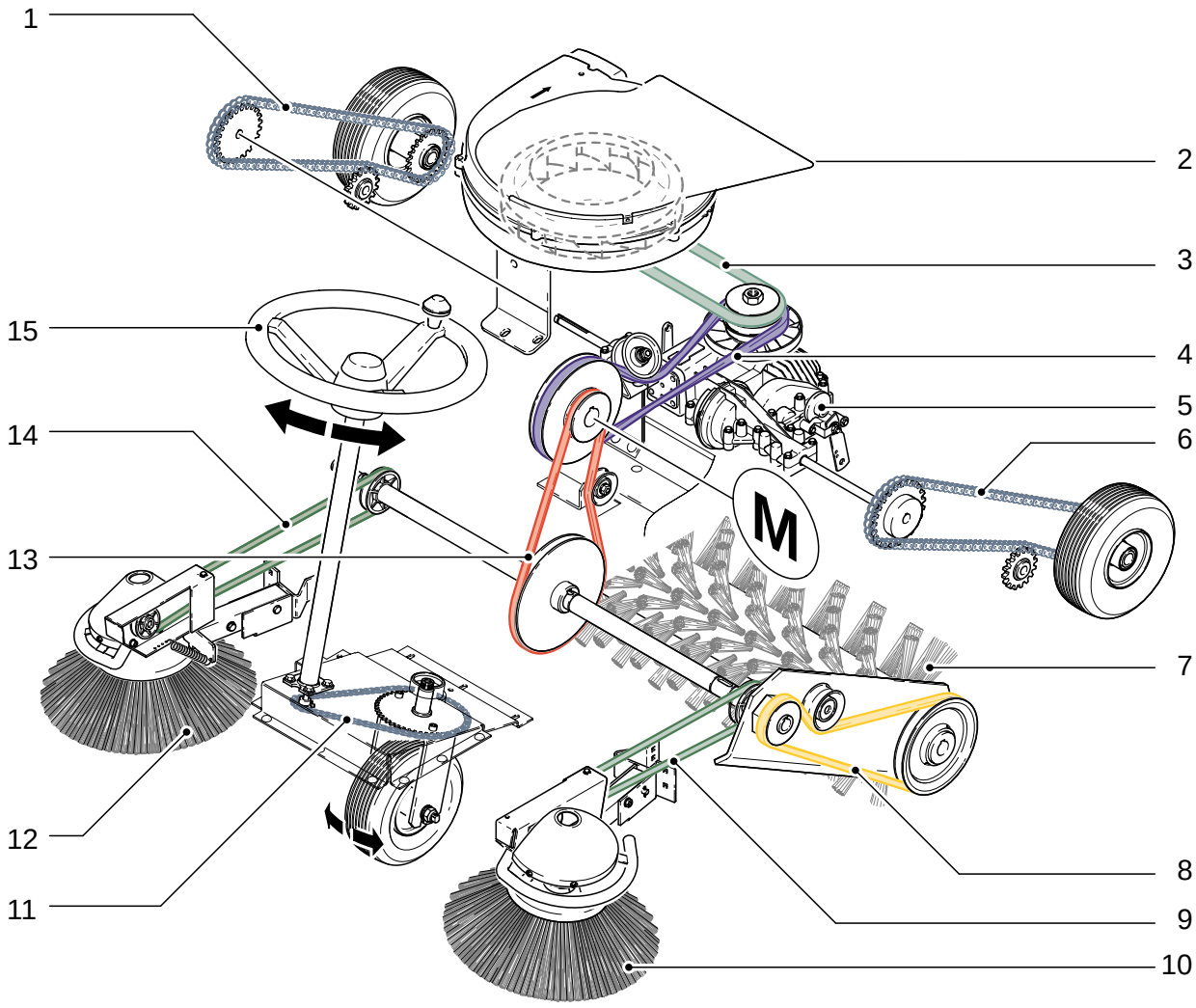
Injector assembly (cross-section)

Injector assembly

The fuel that is conveyed to the injector by the injection pump is transported through the feed channel (14), past the nozzle valve (13), and then sprayed into the engine combustion chamber.

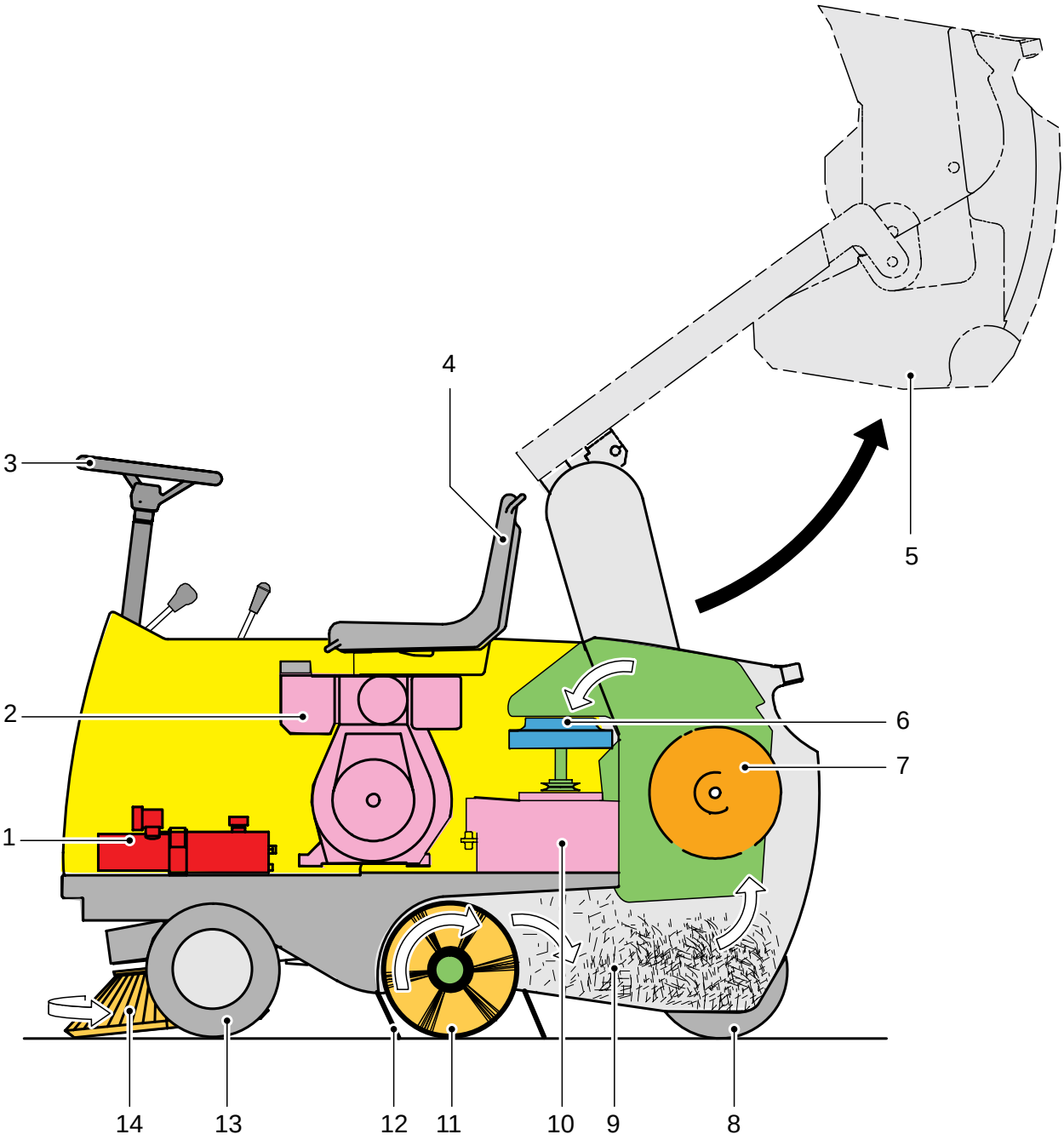
1 Pump piston
2 Shim pack
3 Flange
4 Fuel inlet
5 Pressure valve holder
6 Valve spring
7 Pressure valve
8 Housing, injection pump
9 Piston spring
10 Holder, piston spring
11 Housing, injector
12 Valve spring
13 Nozzle valve
14 Fuel feed line

Steering and Drive Power



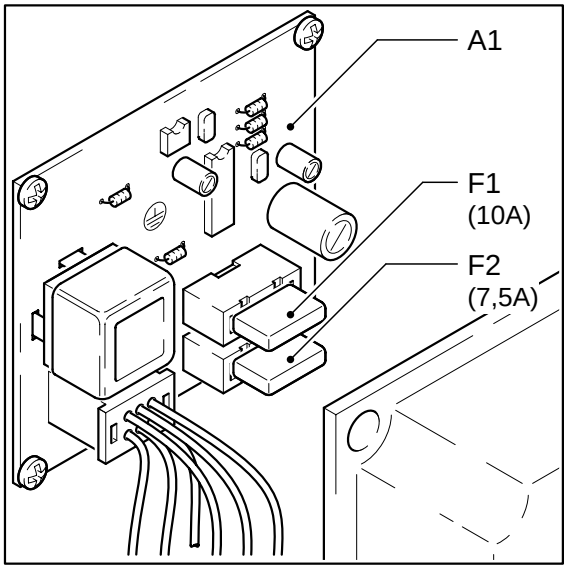
1 RH drive chain
2 Impeller fan
3 Drive belt, impeller fan
4 Drive belt, hydrostatic transmission
5 Hydrostatic transmission
6 LH drive chain
7 Brush roller
8 Drive belt, brush roller
9 Drive belt, LH side brush
(option)
10 LH side brush (option)
11 Chain, steering
12 RH side brush
13 Drive belt, brush roller
14 Drive belt, RH side brush
15 Steering wheel
M Engine

Sweeping system



1	Hydraulic unit	8	Rear wheel
2	Engine B / LPG / D	9	Debris container, lowered
3	Steering wheel	10	Hydrostatic transmission
4	Operator seat	11	Brush roller
5	Debris container, raised	12	Coarse-dirt flap
6	Impeller fan	13	Front wheel
7	Dust filter	14	Side brush

Starter Fails to Turn Engine



Fuses F1/F2 on A1 circuit board

Check fuse F1/F2

Fuse F2 protects the entire control voltage circuitry. This fuse is located on the A1 circuit board.

– Check fuse and replace as required.

A1 Circuit board

F1 Fuse, motor filter cleaning (10 A)

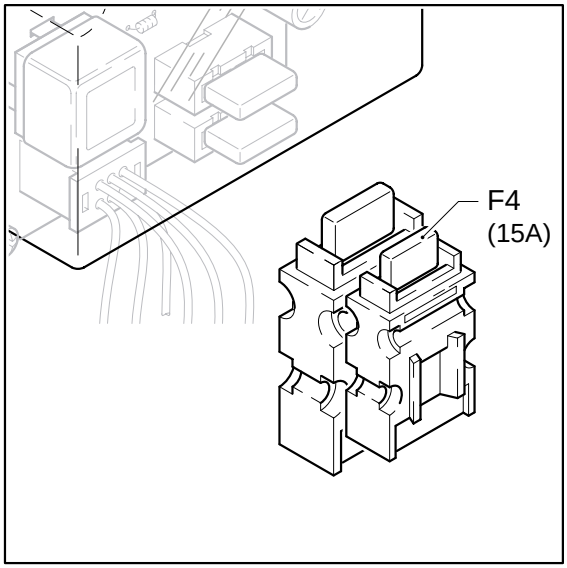
F2 Fuse, control voltage (7,5 A)

Check battery voltage

– Check battery voltage with voltmeter.

– Check electrolyte level on low-maintenance battery.

– If required, recharge battery using external battery charger (e.g., P/N 6.654-046).



Fuse F4 in electrical box

Check fuse F4 and wiring

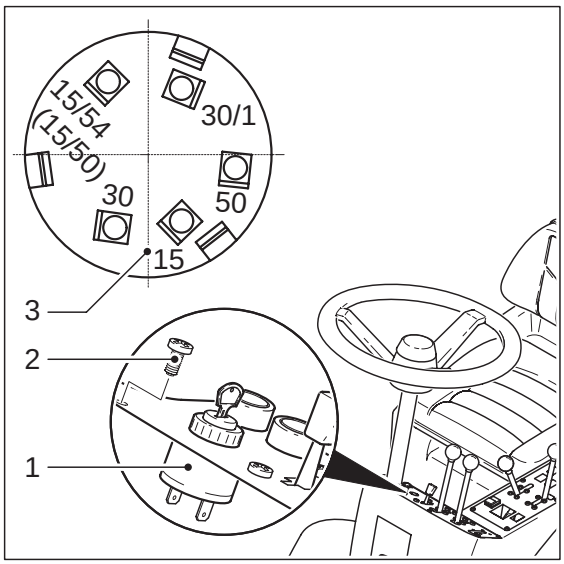
When the engine is running, the battery receives a steady charge current from the alternator.

The fuse F4 (15 A rating) protects this circuit. The fuse is located beneath the electrical box.

– Check fuse and replace as required.

– Check all wiring and connections between alternator and battery.

F4 Fuse, generator



Checking ignition switch S1 while removed from unit

Check ignition switch S1

– Remove screws on instrument panel (2), and carefully lift off instrument panel.

– Check ignition switch (1) for continuity at its various positions (0, 1, 2).

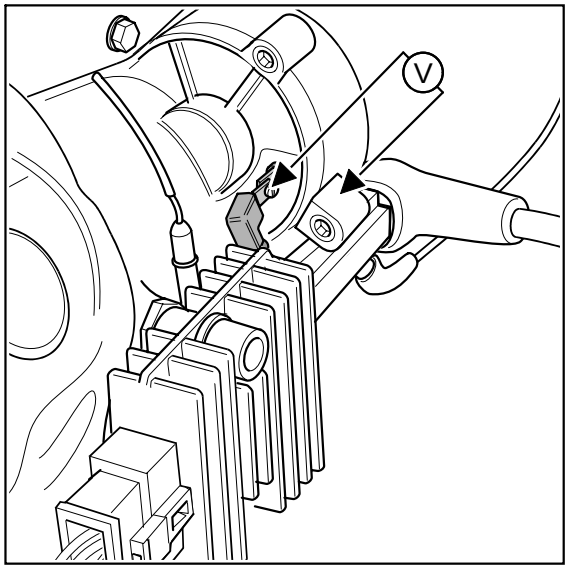
Key position	Connection	Function
0	30/1 - 15	Engine Stop
1	30 - 15/54	In operation
2	30 - 50	Starter

1 Ignition switch (S1)

2 Screws, instrument panel

3 Ignition switch, bottom view

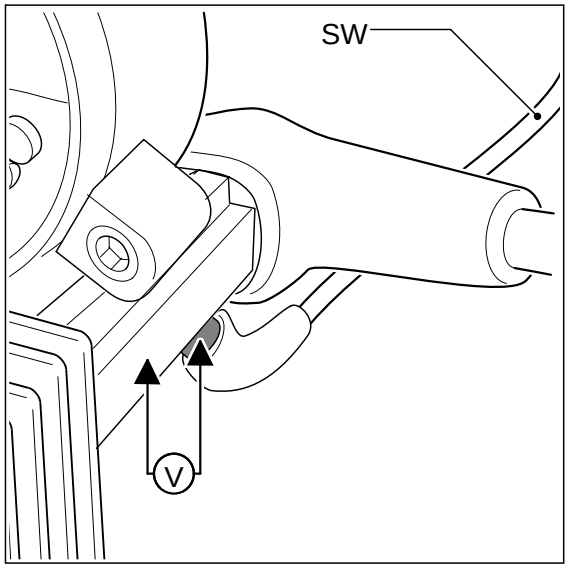
Starter Fails to Turn Engine



Checking voltage on starter motor M1

Check starter M1

– Hold ignition switch in position II.
– If a voltage is present but starter fails to turn, starter is defective and must be replaced.



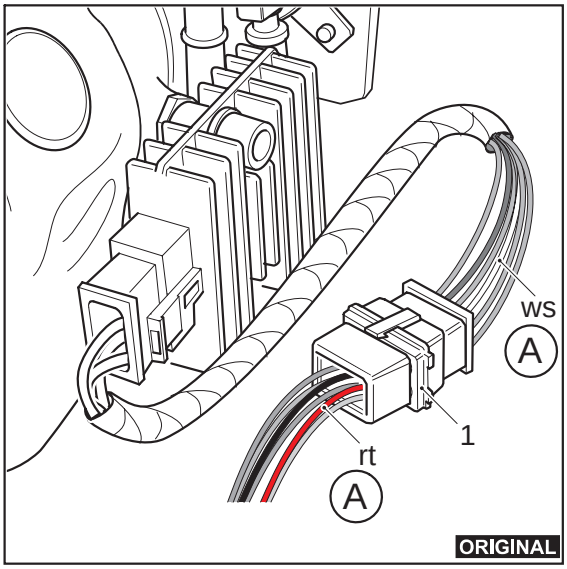
Checking voltage on starter solenoid

Check voltage on starter solenoid

– Hold ignition switch in position II.
– Measure the voltage between solenoid terminal and vehicle ground.
– If the meter fails to indicate a voltage, wiring must be checked for possible defect.
– If a voltage is present but starter fails to turn, starter is defective and must be replaced.

Note:
The connecting wiring for the starter solenoid are not shown in electrical diagram.

Starter Fails to Turn Engine



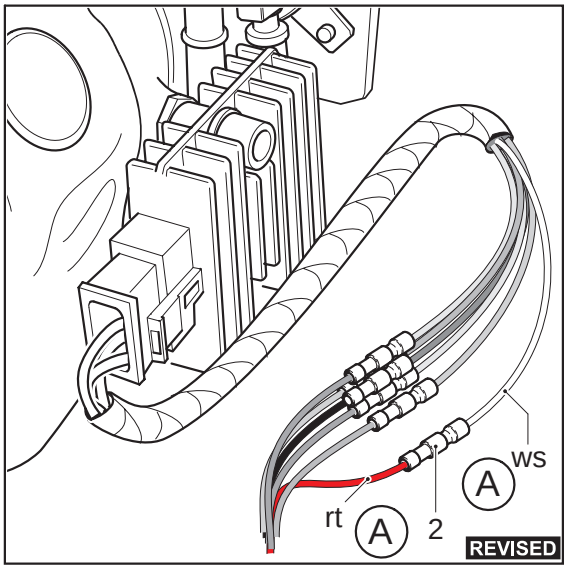
Checking regulator charging current

Check regulator ORIGINAL

When the engine is running, the alternator generates a continuous current flow. The regulator automatically adapts this current as required (depending on battery charge status and electrical load).

– Start engine and allow to run.
– Using a clip-on ammeter, measure regulator charging current on X1 plug coupling (white wire on male connector or red wire on female coupling of X1 connector).

If a charging current cannot be measured, this indicates that the alternator is faulty and must be replaced.



Checking regulator charging current

Check regulator REVISED

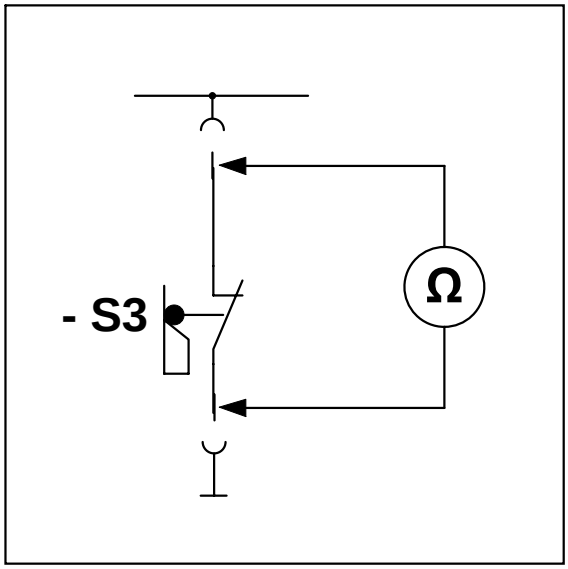
Units of recent manufacture no longer feature the X1 plug coupling. Wires are connected by individual round plug couplings instead.

– Start engine and allow to run.
– Using a clip-on ammeter, measure regulator charging current on red-and-white wire coupling.

If a charging current cannot be measured, this indicates that the alternator is faulty and must be replaced.

ws White wire
rt Red wire
1 Plug coupling
2 Round male plug w/ female coupling

Starter Turns Engine but Engine Fails to Start

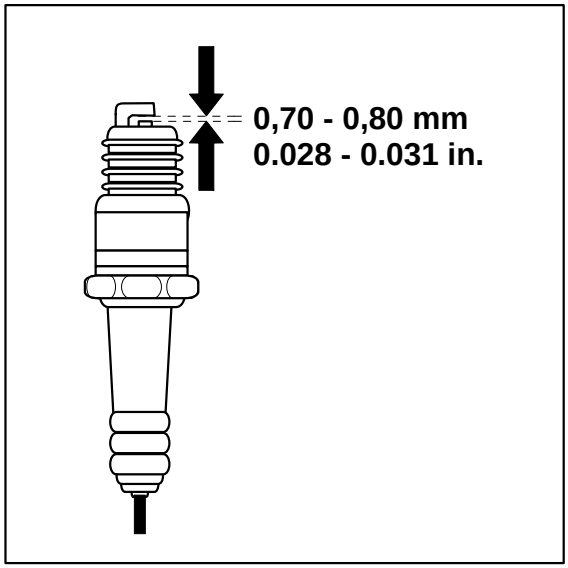


Checking seat contact switch S3

Checking S3 seat contact switch

Note:
Actuating the starter without a load on the seat will crank the engine but not start it!

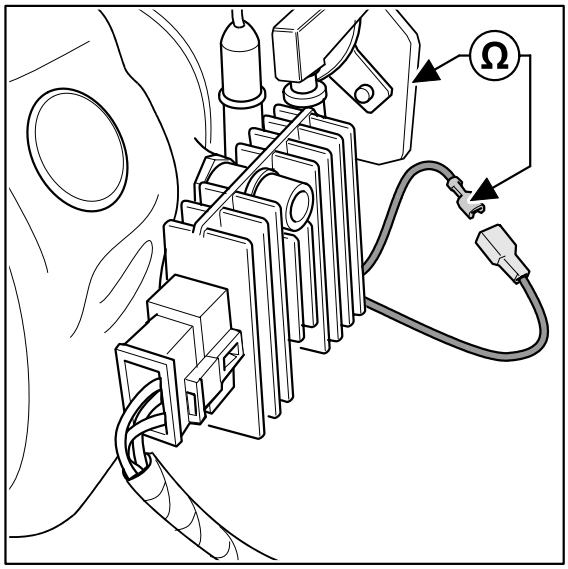
– Disconnect wire connections from seat contact switch.
– Connect an ohmmeter to check seat contact switch for continuity.
– With a physical load on the seat cushion, the switch opens, and there is no continuity.
– In the absence of a physical load on the seat cushion, switch contacts are closed.
– Adjust or replace seat contact switch as required.



Checking spark plug (gasoline & LPG engine)

Check spark plug (gasoline and LPG engine)

– If ceramic insulator shows signs of breakage of cracking, spark plug must be replaced.
– Heavily fouled spark plugs must be replaced.
– Using a feeler gauge, measure electrode gap, and bend electrodes to adjust as required.
– To compress captive seal washer on new spark plug, screw in plug hand-tight, then tighten 1/2 turn. Tighten used spark plugs only by 1/8 to 1/4 turn.



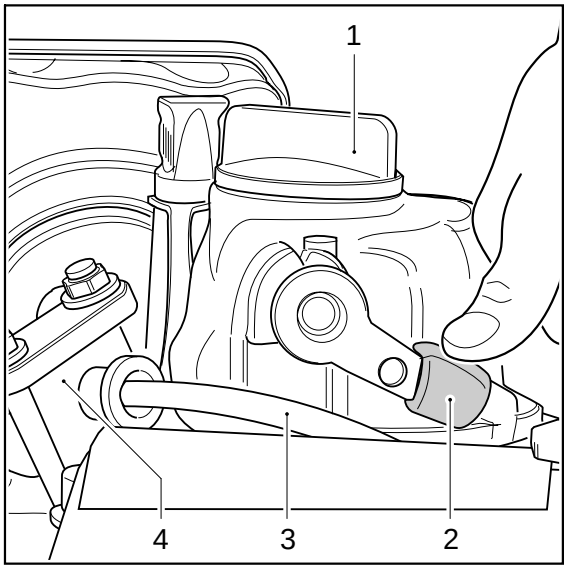
Checking oil level switch S9 (gasoline & LPG engine)

Check oil level switch S9 (gasoline and LPG engine)

In the event that the engine oil level drops down too far, the oil level switch cuts out the ignition. This causes the engine to stall and will prevent engine restarts.

– Remove the terminal of the yellow wire.
– Using the ohmmeter, check the connecting terminal for continuity.
– If the oil level is sufficiently high, there will be no continuity.
– If the oil level is too low, there must be continuity.
– Top up engine oil or replace oil level switch as required.

Starter Turns Engine but Engine Fails to Start

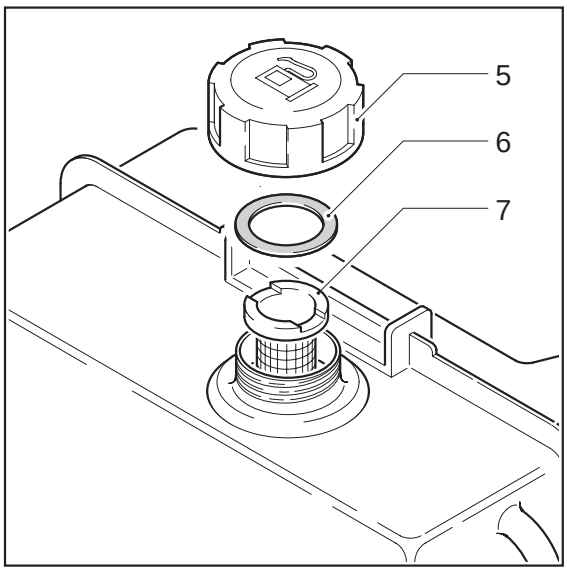


Compression release lever (diesel engine)

Check compression release lever (diesel engine)

– Engine is equipped with compression release lever. During engine starting, it can be actuated for a short while to ease overcoming engine resistance at top dead center.

Note:
To enable engine to start with hood open, seat contact switch must be jumpered. Jumper must again be removed once engine has started.



Fuel filter (diesel engine only)

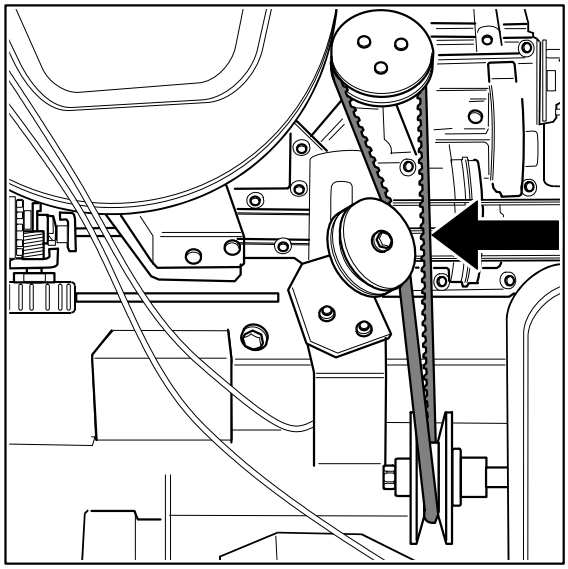
Using Diesel fuel (diesel engine)

Exceptionally low outdoor temperatures may cause diesel fuel to congeal. In this condition, fuel is no longer supplied to the engine.

– To prevent this condition occurring, add viscosity agents (winterized diesel fuel or denatured alcohol) to the tank before cold weather sets in.
– If the fuel congeals, replace fuel tank content with winterized diesel fuel or add viscosity agents.
– Continue by allowing the power sweeper to warm up in a cold environment, with engine idling.

1 Oil filler neck
2 Lever, compression release
3 Injector line
4 Injector
5 Tank filler cap
6 Seal ring
7 Fuel filter

Engine Runs but Machine Fails to Move

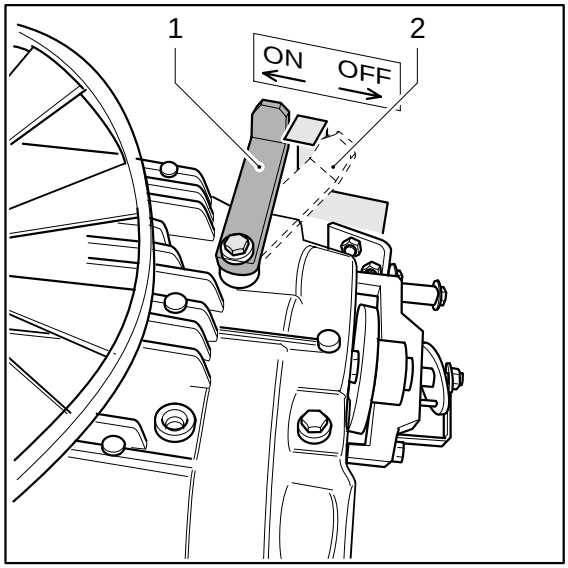


Transmission drive belt with tension roller

Transmission drive belt

The transmission drive belt tension is adjusted by means of the tension roller. The drive belt must be sufficiently tight so that it will not wow through more than 3 to 8 mm (0.12-0.32 in) when applying a force of 2 kg (20 N) to the center of the longest span.

Replace drive belt as required, ensuring that tension roller has first been relaxed.



Freewheeling lever on transmission

Check freewheeling function

The transmission features a freewheeling lever which can be used to engage or disengage the drive power.

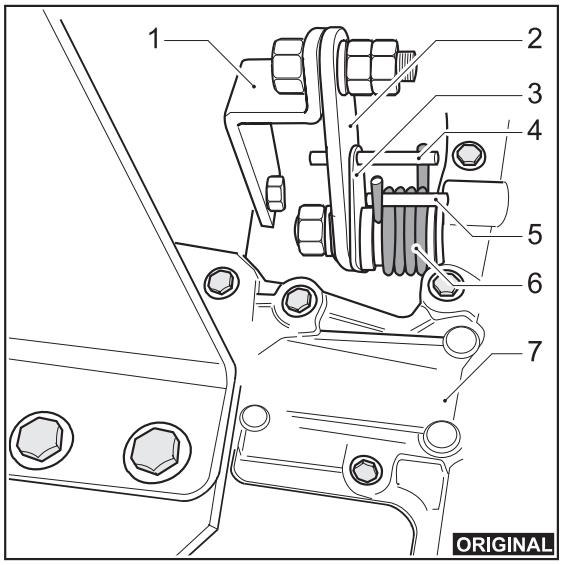
Starting with S/N 10121, this freewheeling lever is permanently mounted on the transmission linkage. It is held in place in the engaged position by a stop bracket.

Even with the drive engaged, the unit may be slowly pushed by hand. However, the drive must be disengaged (clockwise rotation) if the unit is to be moved over extended distances.

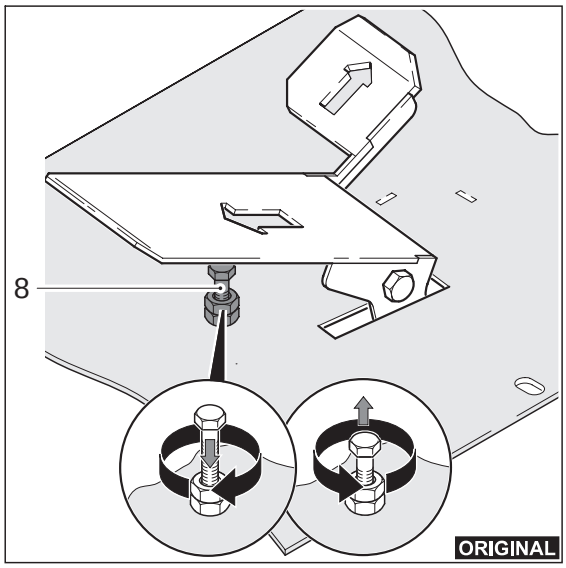
– Position 1: Transmission engaged
– Position 2: Transmission disengaged

Note:
It is important to prevent inadvertent disengagement of the freewheeling lever. Otherwise, no drive power can be applied, and engine braking will be ineffective.

Engine Runs but Machine Fails to Move



Shift lever on transmission



Adjusting drive pedal

1 Drive pedal linkage
2 Shift lever
3 Intermediate plate
4 Dog pin in shift lever
5 Stop pin in transmission
6 Shaft-mounted leg spring
7 Transmission
8 Adjusting screw

Checking drive pedal ORIGINAL

A linkage connects the drive pedal to the shift lever (2) on the transmission (7). When the drive pedal is not actuated, the shaft-mounted leg spring (6) always returns this lever to the center position .

When at the center position, the drive pedal adjustment should provide for equal angles from the horizontal for both forward and return footrests.

An adjusting screw (8) beneath the drive pedal limits pedal travel and, at the same time, the max. drive speed (see technical specifications).

Note:
This limit must be observed especially in the case of units licensed for road travel.

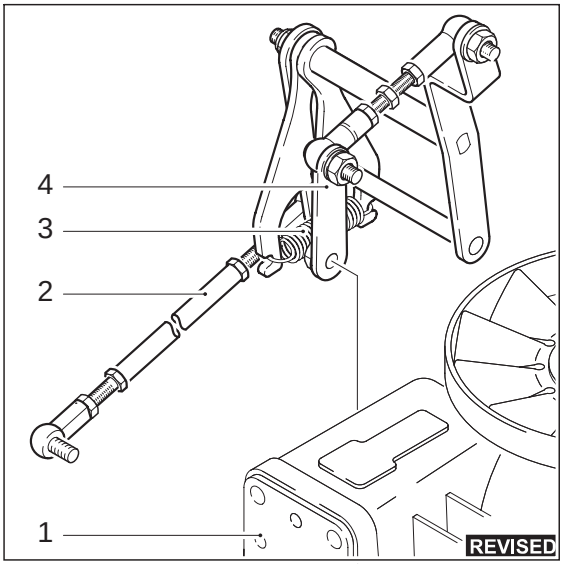
It is essential that the shaft-mounted leg spring (6) securely rests against the dog pin (4) and stop pin (5), and that it does not slip past these two limiters (check intermediate plate (3)).

With the drive pedal at center position and with the parking brake released, the unit may move neither forward nor backward.

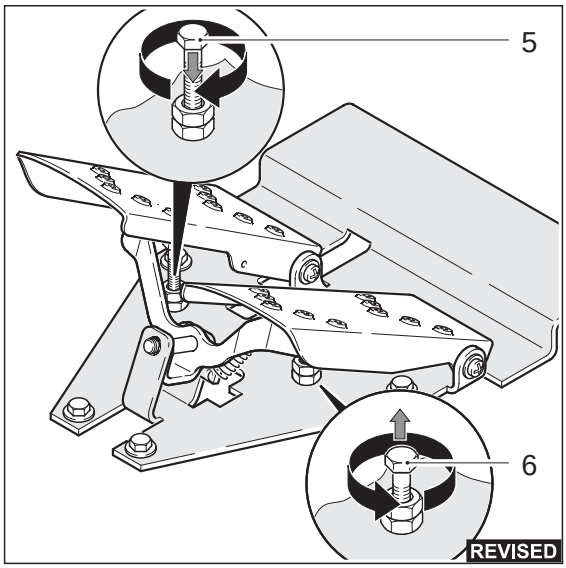
The drive pedal must travel without jerking or binding.

Note:
All adjusting screws must be fixed with sealing lacquer.

Engine Runs but Machine Fails to Move



Shift lever on transmission



Adjusting drive pedals

1 Transmission
2 Drive pedal linkage
3 Pull spring
4 Shift lever
5 Adjusting screw, FWD drive
6 Adjusting screw, REV drive

Checking drive pedal REVISED

A linkage connects the drive pedals to the shift lever (4) on the transmission (1). When the drive pedals are not actuated, the pull spring (3) always returns this lever to the center position.

When at the center position, the drive pedals should be adjusted so that the forward and reverse pedals at equal angles from the horizontal.

Two adjusting screws (5 and 6) beneath the drive pedals limit pedal travel and, at the same time, determine the max. drive speed (see technical specifications).

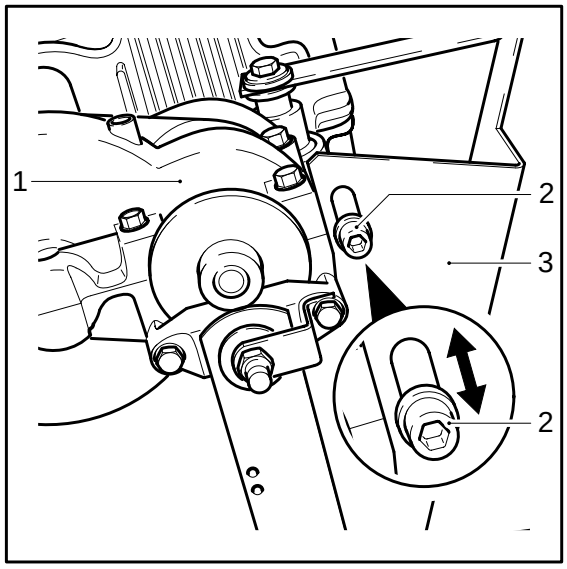
Note:
These limits must be observed especially in the case of units licensed for road travel.

With the drive pedals at center position and with the parking brake released, the unit may move neither forward nor backward.

The drive pedal must travel without jerking or binding.

Note:
All adjusting screws must be fixed with sealing lacquer.

Engine Runs but Machine Fails to Move



Adjusting hydrostatic transmission

fer to service bulletin no. 2001-042)

1 Hydrostatic transmission
2 Bolt w/ stop nut
3 Holding bracket, hydrostatic transmission

Adjust hydrostatic transmission

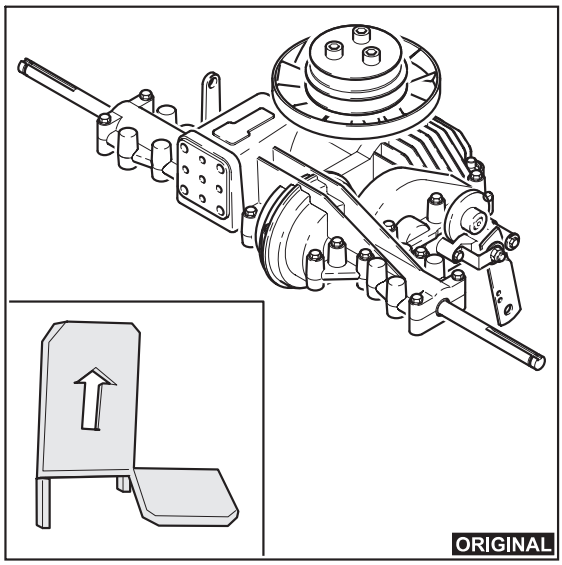
Starting with serial no. 11482 to serial no. 11882, the hydrostatic transmission (1) is installed in a slanted position. As the slant is not adjustable, engine and transmission drive belts may fail after a short while.

Starting with serial no. 11883, it is possible to adjust the incline of the hydrostatic transmission. To this end, the holding bracket (3) was provided with an elongated hole.

– Loosen adjusting bolt (2).
– Position hydrostatic transmission so that drive belts run straight in belt pulleys.
– Securely tighten adjusting bolt and seal with safety paint (2).

Note:
Retrofitting kit 2.882-530 is available for units with serial no's. 11482 through 11883. (Re-

Engine Runs but Machine Fails to Move

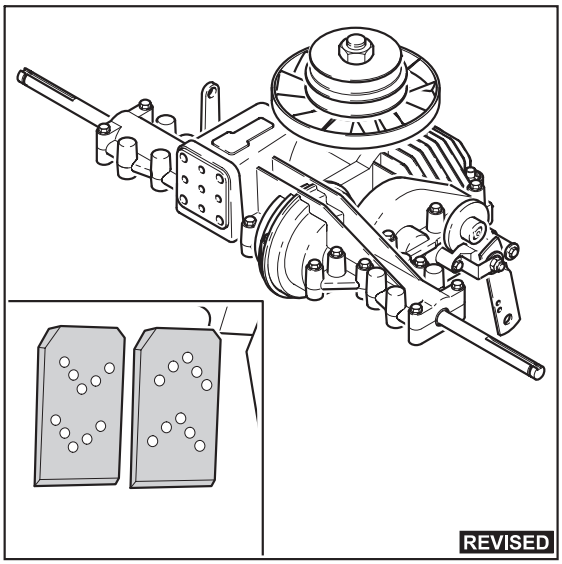


Transmission, thru S/N 10366

Insert hydrostatic transmission

Note:
Starting with serial no. 10 053, the transmission is slanted forward, putting less strain on the drive belt.

Check and observe parking brake effectiveness and belt tension when a new transmission is installed.

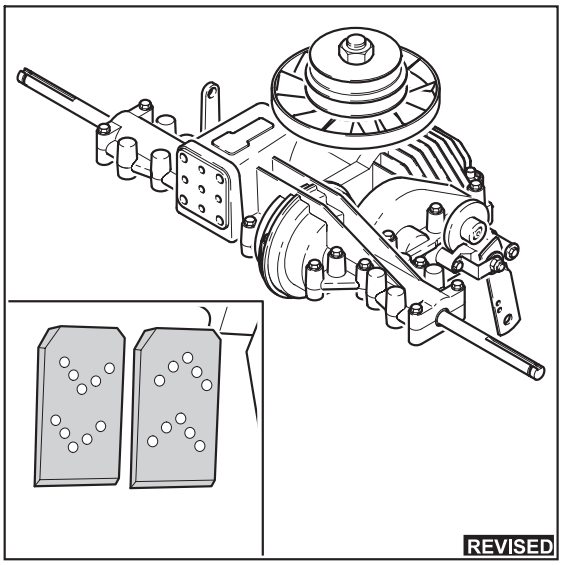


Transmission, S/N 10337 thru 11481

Note:
The KMR 1250 is fitted with three different transmission shafts.

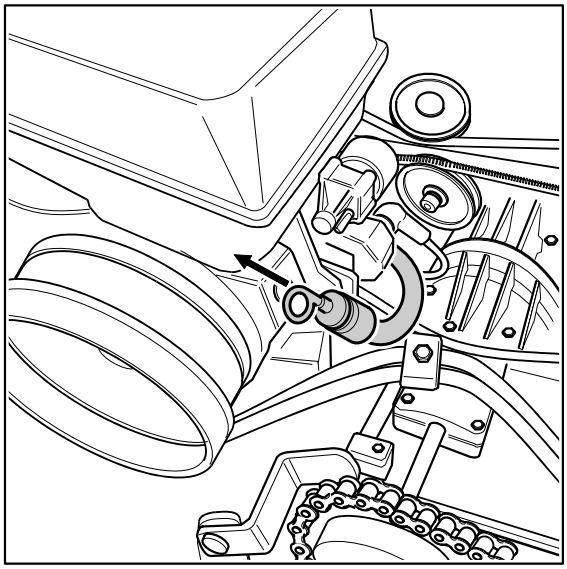
Owing to their different properties and physical construction, these transmissions are not interchangeable.

Part no.	Serial no.	Features
6.454-074	thru 10336	1 pedal
6.454-088	10337 thru 11481	2 pedals
6.454-116	11482 and up	slanted installation

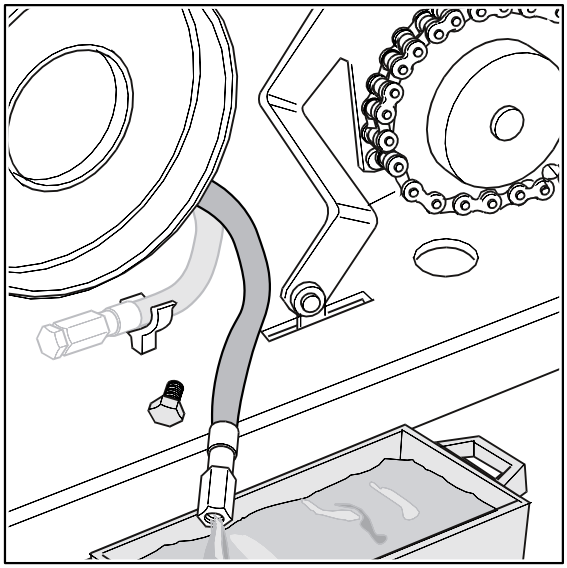


Transmission, serial no. 11482 and up

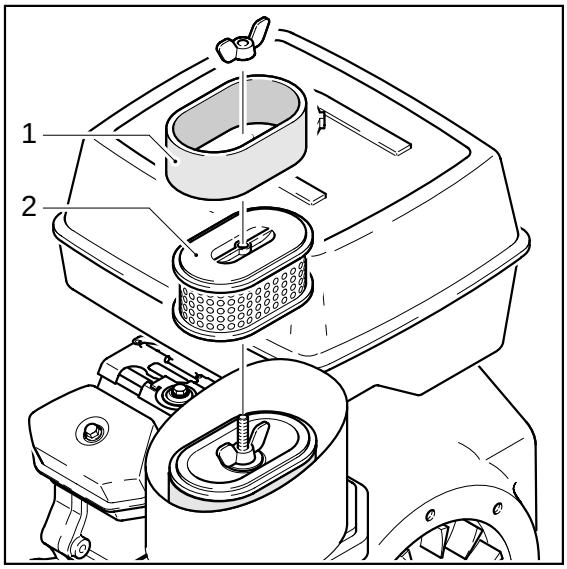
Maintenance Procedures (gasoline and LPG engine)



Oil dipstick



Draining engine oil



Air cleaner w/ foam insert and paper element

Note:
For operating and maintenance instructions, consult the Operator Manual for this engine.

Check engine oil level

– Engine oil level must be between the MIN and MAX markings on the dipstick.

Top up engine oil

– The dipstick hole is used to add new oil to the engine. For oil type and required volume, check unit “Specifications”.

Change engine oil

– Place a suitable catch tray beside the unit.
– While holding oil drain hose in catch tray, remove oil plug and allow engine oil to drain.
– Securely replace oil drain plug.
– Fill engine with new oil. For oil type and required volume, refer to “Specifications”.

Note:
Ensure environmentally safe disposal of used engine oil.

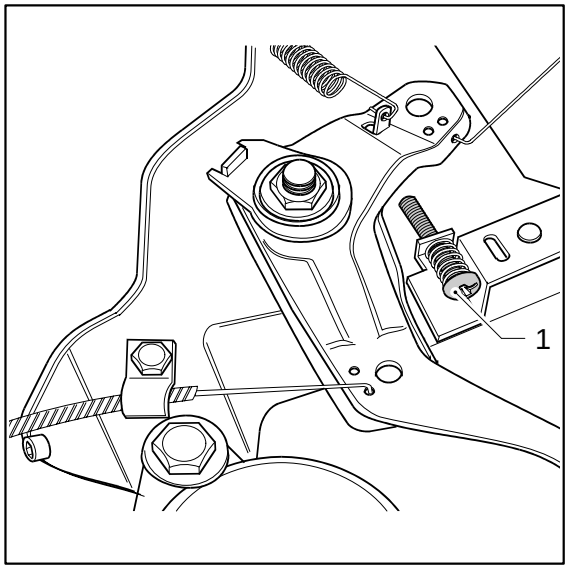
Clean air filter element

When filter element is dirty, replace the paper filter element (2). To clean filter element, blow through with compressed air from the inside out, or firmly tap on hard surface to dislodge caked-on dust. **Do not brush off because this would press dust particles into paper fibers.**

Wash foam ring (2) with a mild solution of household detergent. Rinse thoroughly and allow to dry. Immerse foam insert in clean engine oil, and squeeze to remove excess oil. If too much oil is allowed to remain in foam insert the engine will smoke while running.

1 Foam ring
2 Paper element

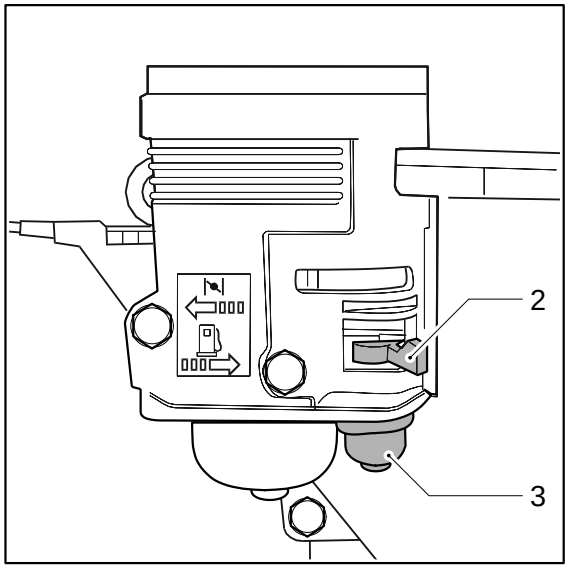
Maintenance Procedures (gasoline and LPG engine)



Adjusting engine operating speed

Operating RPM adjustment

The engine operating speed (refer to „Specifications“) is set by means of the adjustment screw (1). Once the setting is correct, the screw must be fixed with sealing lacquer.



Carburetor w/ fuel cock and sediment bowl

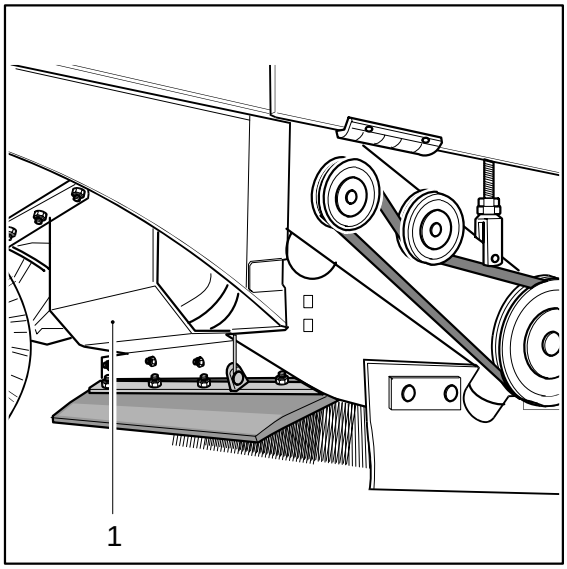
1 Adjusting screw, engine operating RPM
2 Fuel cock
3 Sedimentation cup

Clean sediment bowl

– Set fuel cock (2) to OFF position.
– Remove sedimentation cup (3) complete with O-ring, and wash out with nonflammable cleaner or inert cleaning solvent. Allow to dry thoroughly, then install and tighten securely.
– Set fuel cock (2) again to OPEN position. Check for possible leaks around sedimentation cup.

Note:
Ensure that no spilled fuel remains in area around carburetor before starting engine. When engine has started, check sedimentation cup for leaks.

Maintenance Procedures (LPG engine)



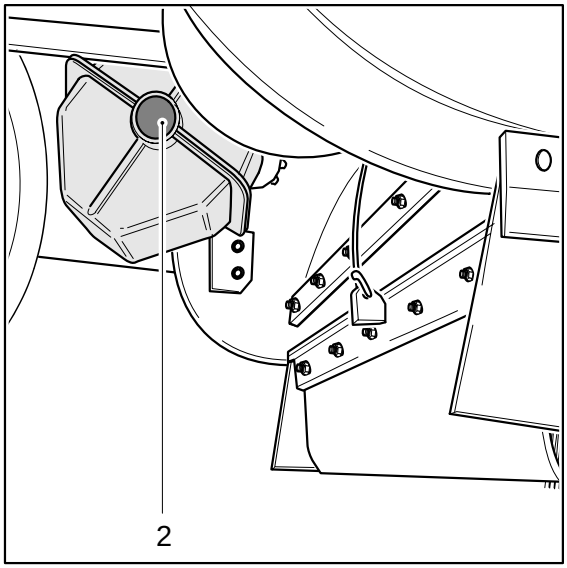
Removing muffler guard

Set CO value (LPG engine)

To adjust CO value, the following measuring devices will be needed:

– Tachometer, P/N 6.491-361

– Exhaust analyser. Procure suitable CO analyser locally; requires measuring range up to 2% CO.



Measuring CO value inside muffler tailpipe

1. Set CO value at idle speed

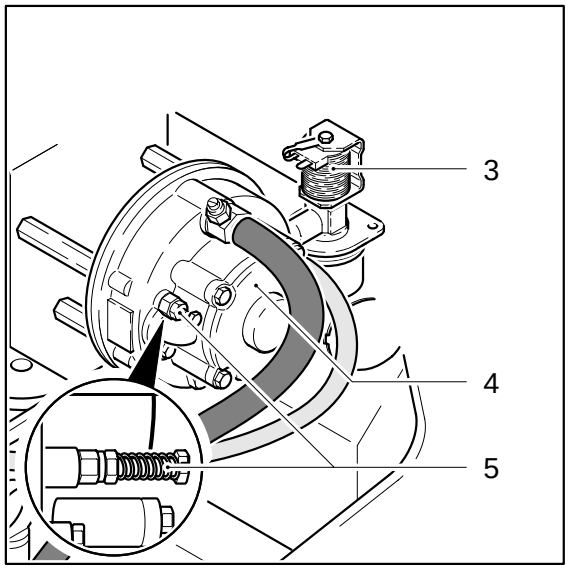
– Start engine, and set accelerator lever on instrument panel to **MIN** position. Idle speed should be between 1250 and 1550 RPM (see also “technical specifications”).

– Let engine warm up for a few minutes.

– Using a floor jack, raise front of unit, and remove muffler guard (1). There is no other way to access the muffler outlet.

– Measure CO value inside muffler tailpipe (2).

– Using the mixture control screw idle speed) (5), set CO value on gas regulator (4) **(nominal CO value is 0.5%**).



Setting CO value w/ mixture control screw (idle speed)

– With the correct adjustment, engine must run smoothly and quietly, and provide reliable starting.

– With adjustment completed, fix mixture control screw (5) by applying sealing lacquer.

1 Muffler guard

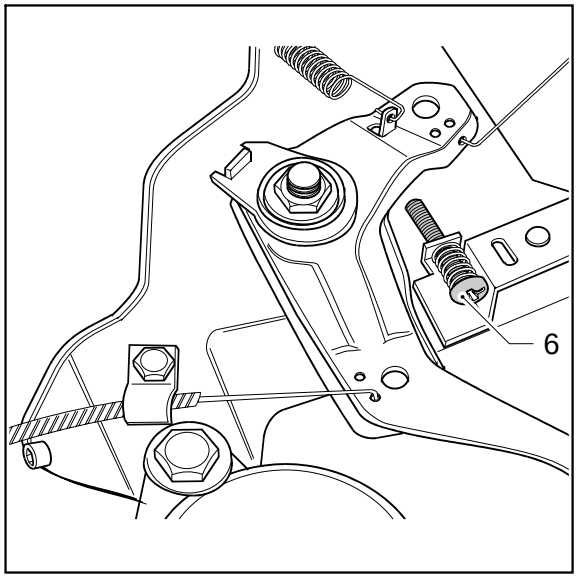
2 Muffler

3 Solenoid valve

4 Gas regulator

5 Mixture control screw (idle speed)

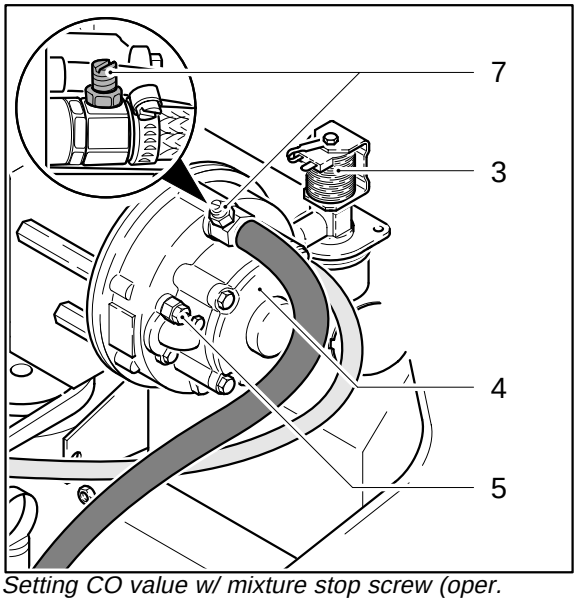
Maintenance Procedures (LPG engine)



Adjusting operating speed

2. Set CO value at operating speed

– Set accelerator lever on instrument panel to **MAX** position (operating speed).
– Measure operating RPM and adjust via stop screw (6) on carburetor as required. Operating speed has to be between 2600 and 2700 RPM (see also “technical specifications”).
– With adjustment completed, fix carburetor stop screw (6) by applying sealing lacquer.
– Check CO value inside muffler tailpipe.

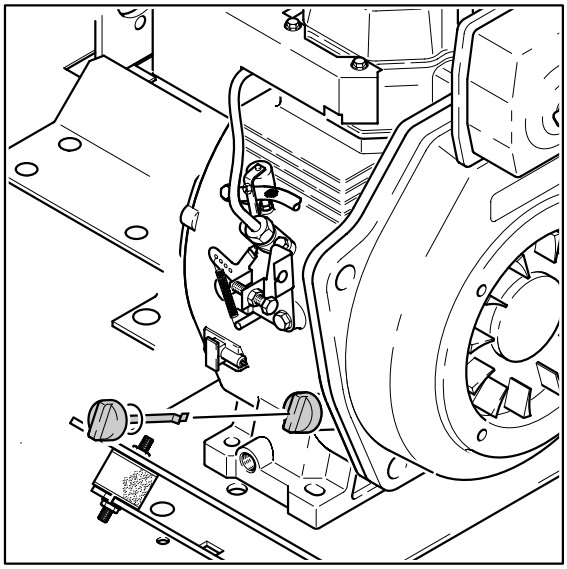


Setting CO value w/ mixture stop screw (oper. speed)

– Using the mixture control screw (idle speed) (7) (operating speed), set CO value on gas regulator (4) **(nominal CO value is 0.5%)**.
– With the correct adjustment, engine must run smoothly and quietly, and provide reliable starting.
– With adjustment completed, fix mixture control screw (7) by applying sealing lacquer.

3 Solenoid valve
4 Gas regulator
5 Mixture control screw (idle speed)
6 Carburetor stop screw
7 Mixture control screw (operating speed)

Maintenance Procedures (diesel engine)



Oil dipstick, diesel engine

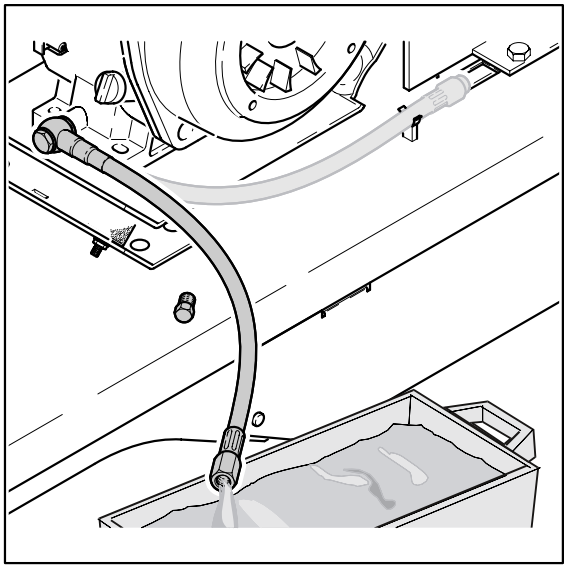
Note:
For operating and maintenance instructions, consult the Operator Manual for this engine.

Check engine oil level

– Engine oil level must be between the MIN and MAX markings on the dipstick.

Top up engine oil

– The dipstick hole is used to add new oil to the engine. For oil type and required volume, refer to “Specifications”.



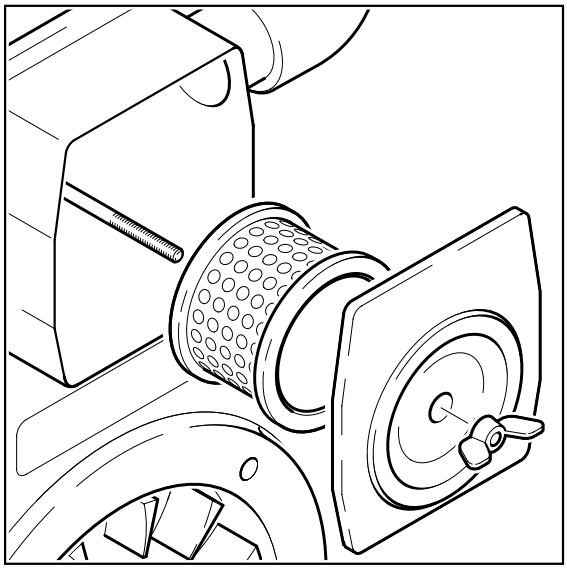
Draining engine oil, diesel engine

Change engine oil

– Place a suitable catch tray beside the unit.
– While holding oil drain hose in catch tray, remove oil plug and allow engine oil to drain.
– Securely replace oil drain plug.

Note:
Ensure environmentally safe disposal of used engine oil.

– Fill engine with new oil. For oil type and required volume, refer to “Specifications”.



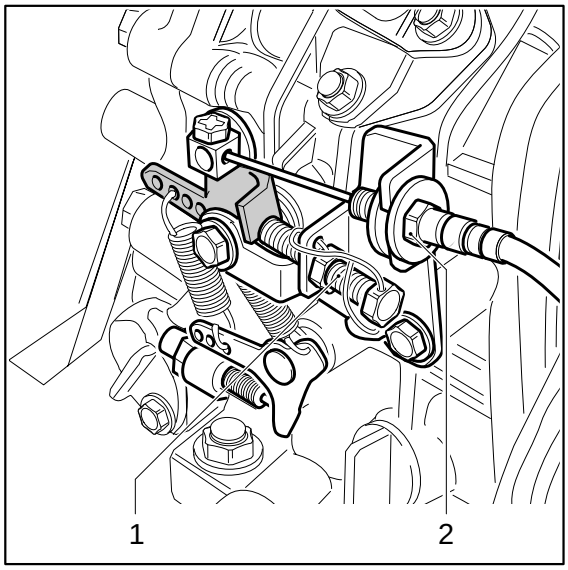
Air cleaner w/ paper element, diesel engine

Check air filter element

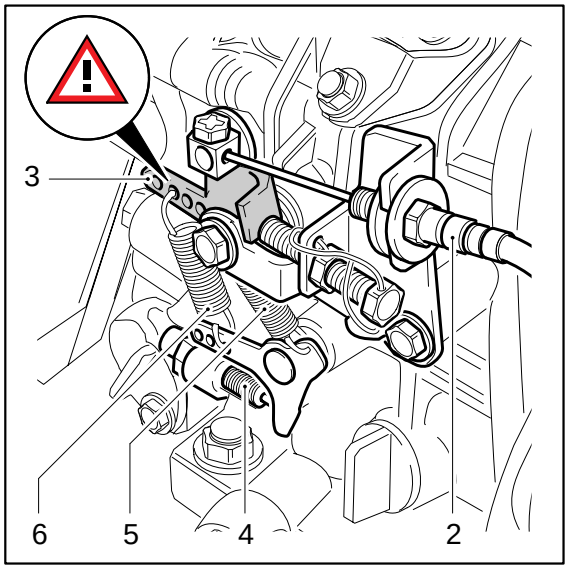
When filter element is dirty, replace the paper filter element. To clean filter element, blow through with compressed air from the inside out, or firmly tap on hard surface to dislodge caked-on dust.

Do not brush off because this would press dust particles into paper fibers.

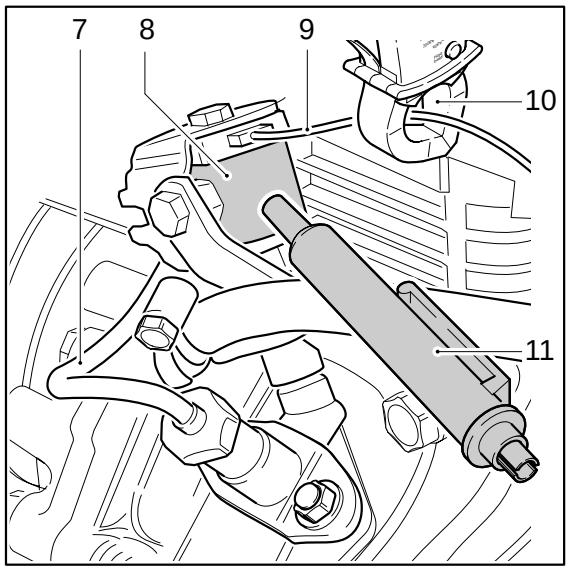
Maintenance Procedures (diesel engine)



Adjusting engine operating speed, diesel engine



Governor adjusting screw, diesel engine



Checking fuel solenoid valve, diesel engine

Operating RPM adjustment

Engine operating speed (refer to "technical specifications") is set by means of the adjusting screw (1).

With adjustments completed, the screw must be fixed by applying sealing lacquer.

Governor adjusting screw

CAUTION

Governor spring (6) must be hooked into hole on governor lever (3) exactly as shown.

Adjusting screw (4) must be fixed with sealing lacquer. Screw may not be tampered with as this would change the entire engine setup.

Check fuel solenoid valve

Upon engine shutdown at the ignition switch, the fuel solenoid valve (8) shuts off fuel supply through the injector line (7).

If the engine fails to shut off:

– Check connecting wire (9) for secure connection.

– Use magnetic field tester (11) to determine if a magnetic field is generated upon actuating the ignition switch (confirmation by beep tone on magnetic field tester).

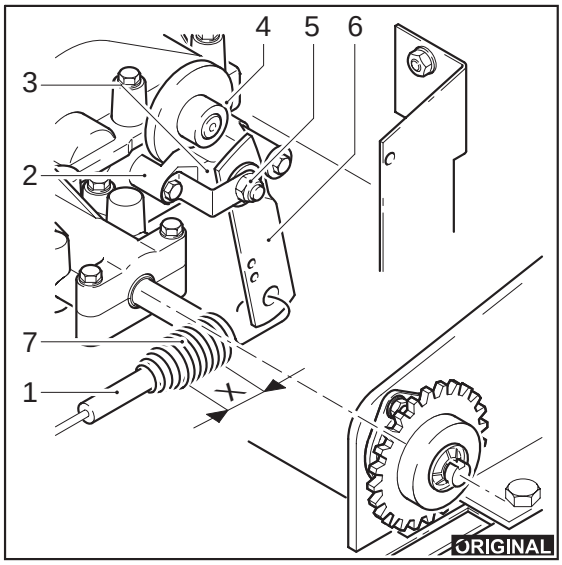
OR

– Use Clip-on ammeter (10) to determine switching on/off at ignition switch will cause a current at connecting wire (9).

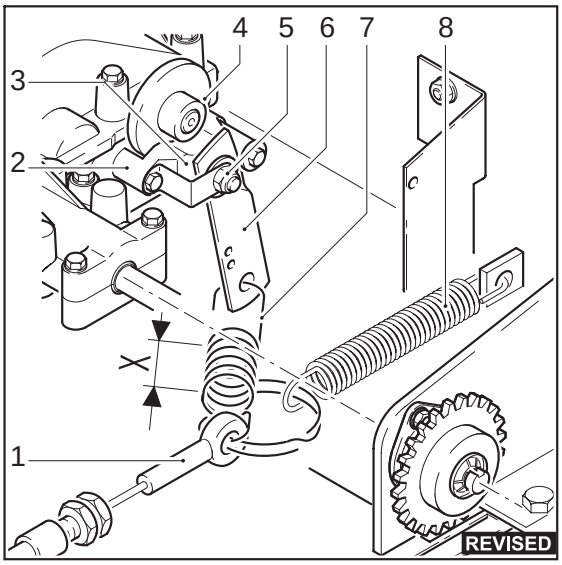
In the absence of a current flow, the fuel solenoid valve (8) is defective and must be replaced.

1 Adjusting screw, operating speed
2 Throttle control cable
3 Governor lever
4 Adjusting screw, governor
5 Governor spring
6 Governor spring
7 Injector line
8 Fuel solenoid valve
9 Connecting wire
10 Clip-on ammeter (Multimeter)
11 Magnetic field tester

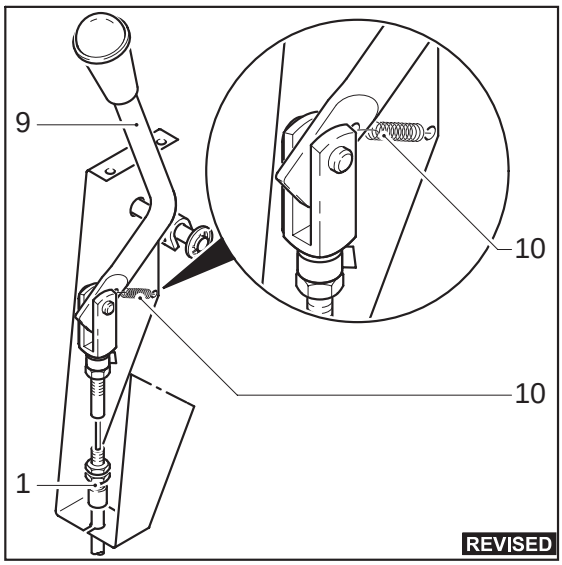
Parking Brake – No Function



Adjusting parking brake



Adjusting parking brake



Parking brake w/ pull spring

Adjust parking brake

> **Note:**
> With the parking brake released, there must be **NO** braking effect, and the wire and casing cable (1) must be fully relaxed.

The parking brake is required to securely hold the unit in place when applied on a grade of 25%, and with the unit loaded to capacity.

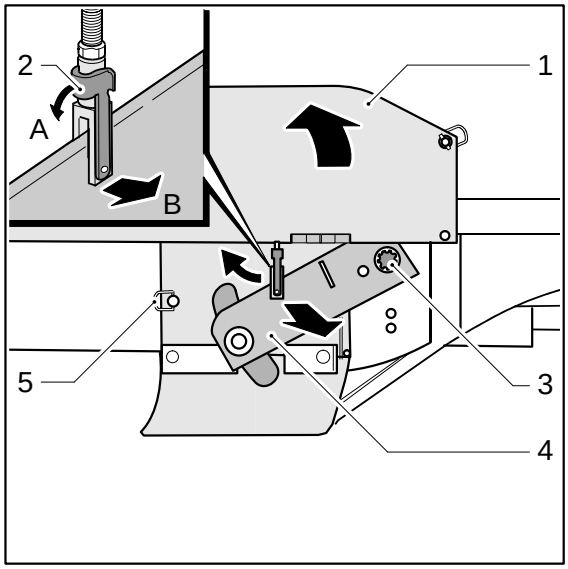
At the same time, tension (X) of the pull spring (7) may not extend by more than 5 to 10 mm (0.20-0.40 in).

Brake adjustment is accomplished with adjusting nut (5).

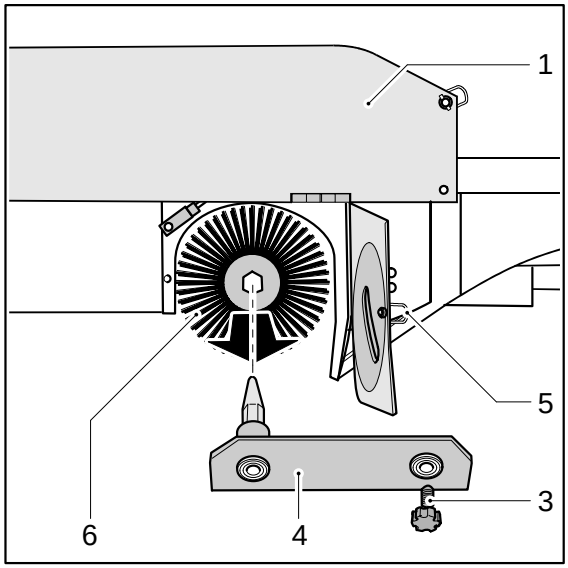
- Starting with serial no. 10600, a pull spring is installed on the operating lever (9). This ensures a more easy movement of the brake when the operating lever (9) is actuated.

1 Wire and casing cable
2 Brake caliper
3 Brake piston
4 Brake pulley
5 Adjusting nut
6 Brake lever
7 Pull spring
8 Pull spring
9 Operating lever, parking brake
10 Pull spring

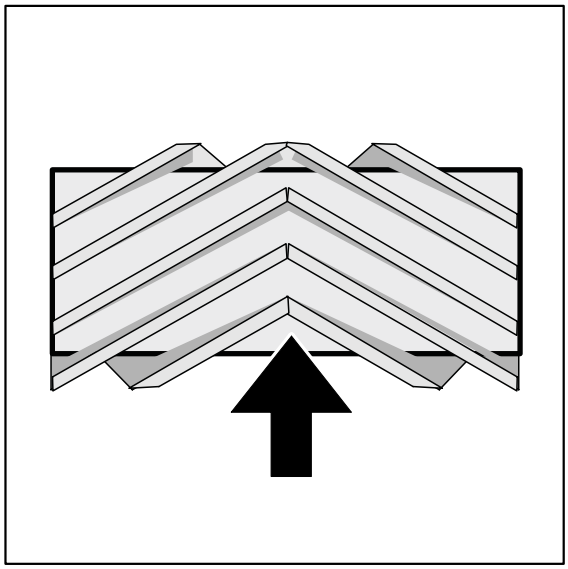
Brush Roller – Poor Performance



Removing brush roller arm



Extracting brush roller



Brush roller, installed position. Arrow points FWD.

Check tire pressure

Uneven tire pressure in the rear wheels causes the power sweeper to tilt sideways and run lopsided. The result may be a substandard sweeping pattern and the cleaning result is not satisfying.

Check control cables

The combination of excessive strains at deflection pulleys and repeated road soiling exert considerable stresses on mechanical control cables.

If required, check cable routing, clean cables, and lubricate with new grease (P/N 6.288-107).

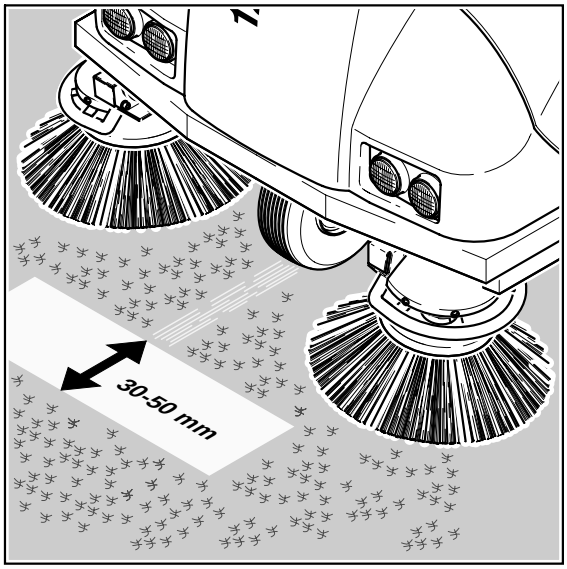
Replace brush roller

– Stop and park the machine, engage parking break.
– Using the operating lever, lower brush roller to center position.
– Swing RH side hatch (3) upward.
– Remove safety bolt (2) at lower end of fork head (A, B), and pivot rod toward the rear.
– Turn knurled screw (3) counterclockwise.
– Remove brush roller arm (4).
– Open turn-lock latch (5), and swing hinged brush roller hatch toward front of unit.
– Extract brush roller (6).
– Turn brush roller adjustment screw clockwise until seated.
– Install new brush roller, then replace brush roller arm.

Note:
Ground clearance of raised brush roller must be at least 10 mm (0.40 in).

1 Side hatch
2 Safety bolt
3 Knurled screw
4 Brush roller arm
5 Turn-lock latch for hinged brush roller hatch
6 Brush roller

Brush Roller – Poor Performance

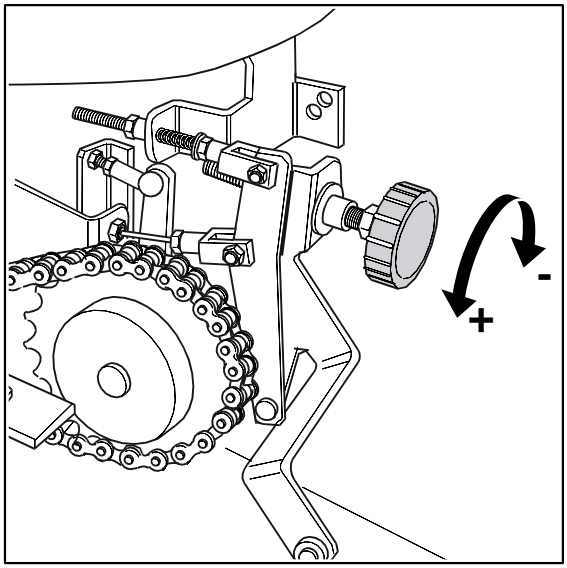


Checking sweeping pattern

Check sweeping pattern

– Close dust pickup hatch.
– Drive mobile sweeper onto dusty surface, and set parking brake.
– Lower brush roller (lever in center position), and allow to run in place for a few seconds.
– Raise brush roller and, with coarse debris hatch open, reverse a few feet.

Note:
Sweeping pattern width should be between 30 and 50 mm (1.18-1.97 in). Parallel deviation should be less than 15 mm (0.60 in).

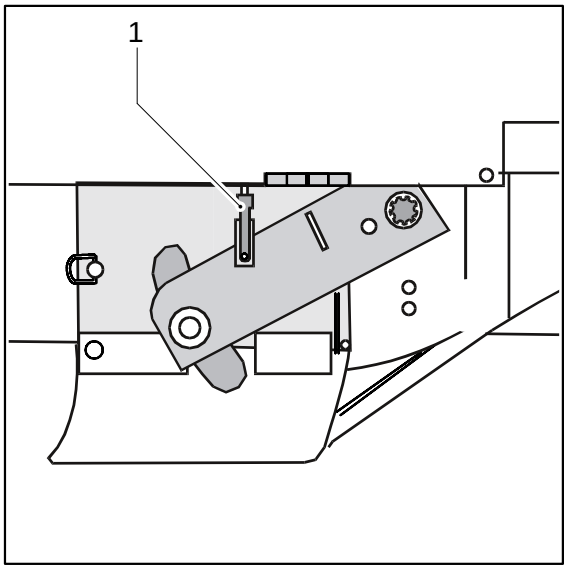


Modifying sweeping pattern

Modify sweeping pattern

The sweeping pattern is modified by means of the central adjustment screw:

– To increase pattern contact area: Turn out adjusting screw counterclockwise (**+**).
– To increase pattern contact area: Turn in adjustment screw clockwise (**–**).



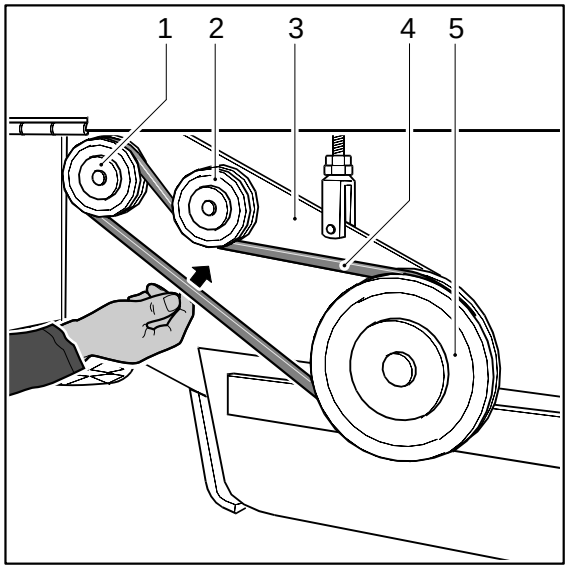
Setting sweeping pattern

Set correct sweeping pattern

A wedge-shaped sweeping pattern may be set by adjusting brush roller suspension on the fork head (1). This may be accomplished by manipulating the fork head on either left-hand or right-hand side, or on both sides.

1 Fork head

Brush Roller – No Rotation



Checking brush roller drive belt

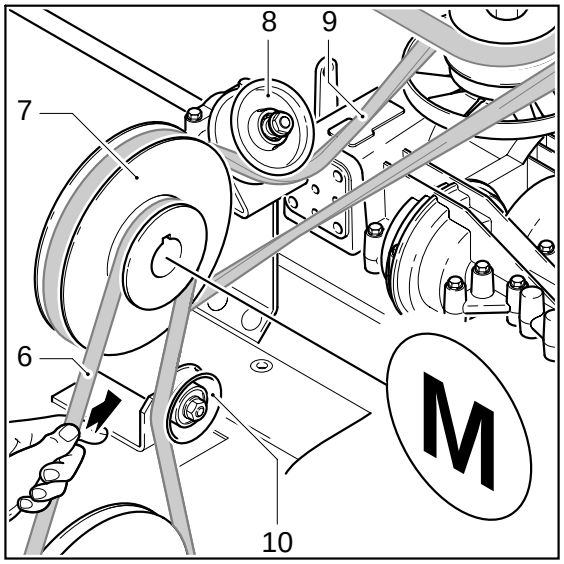
Check / replace Brush roller

In the event that wrap-around string or banded materials block the brush roller, the latter must be deinstalled and obstructions removed. Adjust drive belt tension rollers to allow approx. 10 mm depression of the respective drive belts.

Check / replace brush roller drive belt (4)

This drive belt (4) is located on the vehicle left in the brush well.

If required, replace drive belt after relaxing tension roller (2).

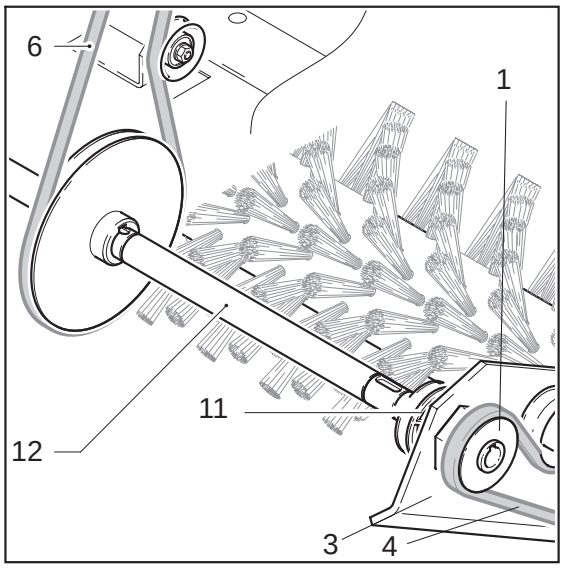


Checking drive belts for sweeper

Check / replace sweeping drive belt (6)

This drive belt (6) is located on the smaller sheave of the belt pulley (7).

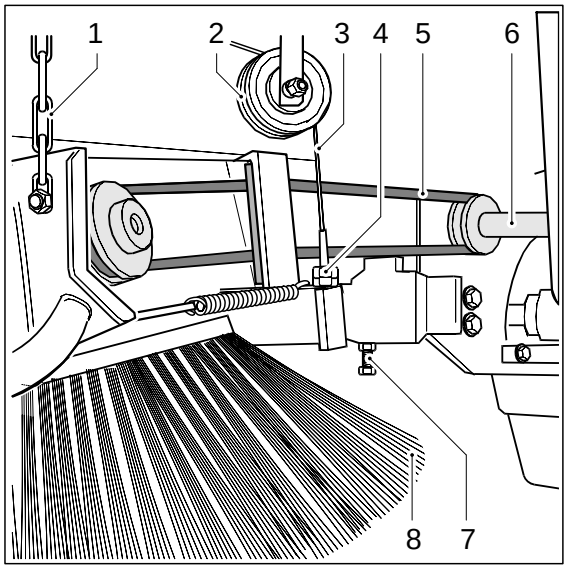
- Loosen tension roller (2), remove drive belt (4) and brush roller arm (3).
- Loosen tension rollers (8) and (10), remove drive belt (9). Disconnect the drive belt (6) from the belt pulley (7).
- Remove drive belt (11).
- Loosen intermediate shaft at the flange mounting (11). The drive belt (6) can now be removed.
- Place new drive belt (6) on intermediate shaft (12), and on the smaller of the two sheaves on pulley (7).
- Reinstall all previously removed components in reversed sequence, then tighten drive belts.



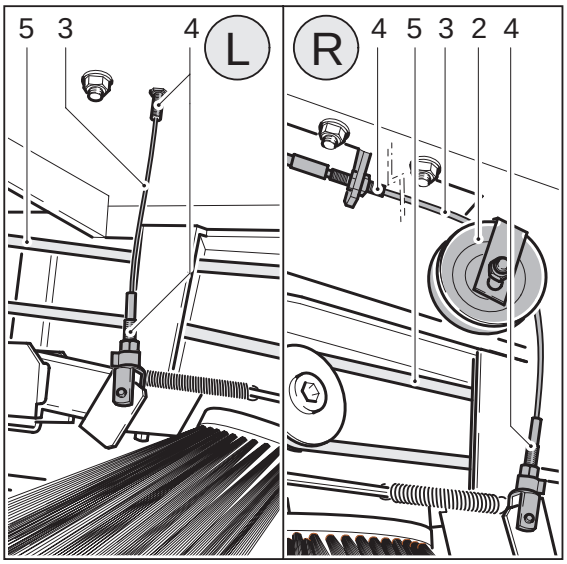
Removing intermediate shaft

1 Belt pulley, intermediate shaft
2 Tension roller, main roller drive
3 Brush roller arm
4 Drive belt, brush roller
5 Belt pulley, brush roller
6 Drive belt, sweeping drive
7 Belt pulley, engine
8 Tension roller, hydrostatic transmission
9 Drive belt, hydrostatic transmission
10 Tension roller, sweeping drive belt
11 Flange mounting
12 Intermediate shaft
M Driving engine

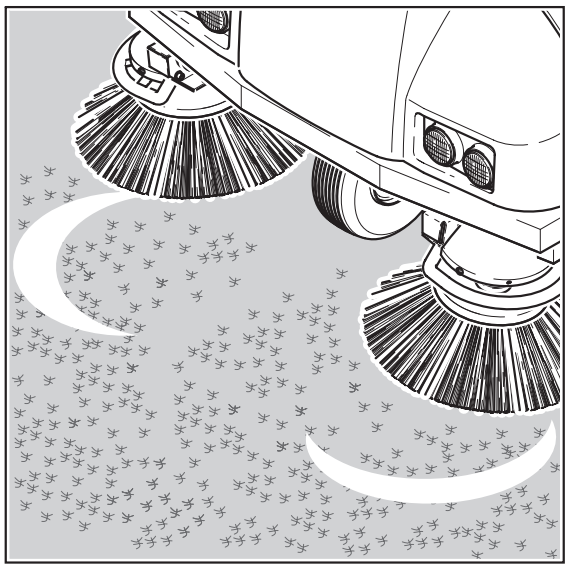
Side Brushes – Poor Sweeping Performance



Side brush drive belt (shown at right)



Adjusting LH and RH side brushes



Checking sweeping patterns

Check drive belt side brush

The side brush is driven by elastic drive belt (5) via intermediate shaft (6).

Belt replacement necessitates deinstallation of intermediate shaft (6) (see page 35, pos. 12).

Check control cable side brush

The control cable (3) is subjected to considerable strain through exposure to road soiling. If required, check cable routing via deflection pulley (2) for ease of movement. Clean and lubricate with new grease, P/N 6.288-107.

Replace side brush

The side brush is attached to the underside of the transmission by means of three bolts.

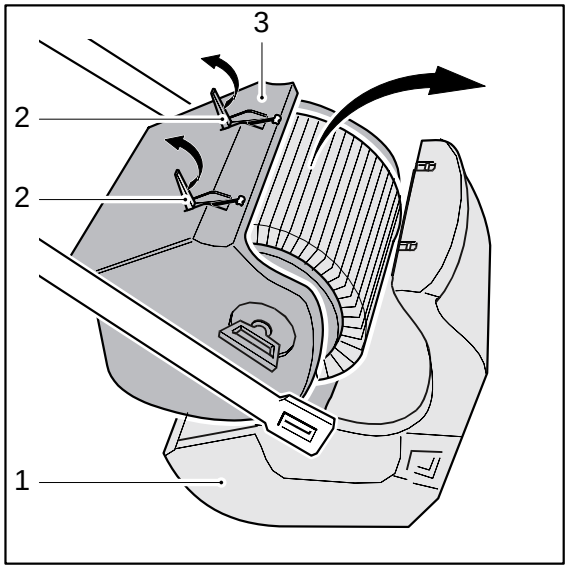
Sweeping pattern – Check / adjust

– Sprinkle a level surface evenly with fine sand. Drive machine onto this surface, and set parking brake.
– Lower side brush, and allow to run for approx. 15 to 30 seconds. Continue by raising side brush, backing sweeper off test surface.
– The bottom position of the side brush is adjusted by means of the stop screw (7). The sweeping pattern should be shaped like a half-moon sickle.
– The top position of the side brush is adjusted by manipulating the control cable adjustment (4). Ground clearance of raised side brush must be approx. 10 to 15 mm (0.40-0.60 in).

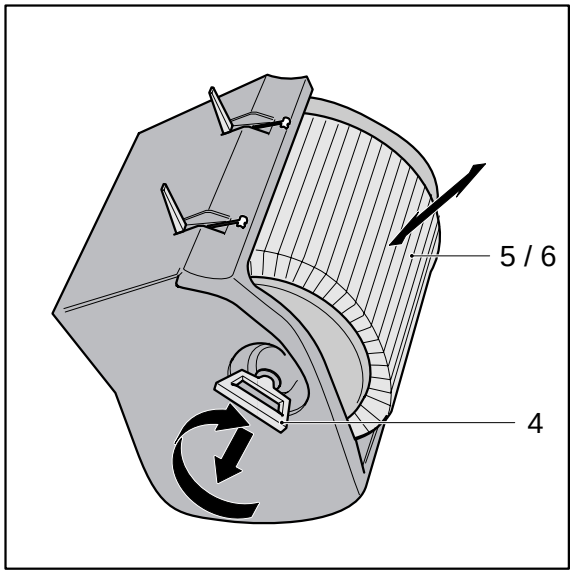
Note:
The side brush must be easily moved down and up by means of the control lever. When operating, it extends approx. 15 cm (5.9 in) beyond the machine footprint, with extension radius limited by a chain (1).

1 Chain
2 Deflection pulley
3 Control cable
4 Control cable adjustment, ground clearance
5 Drive belt
6 Intermediate shaft
7 Stop screw, contact pressure
8 Side brush

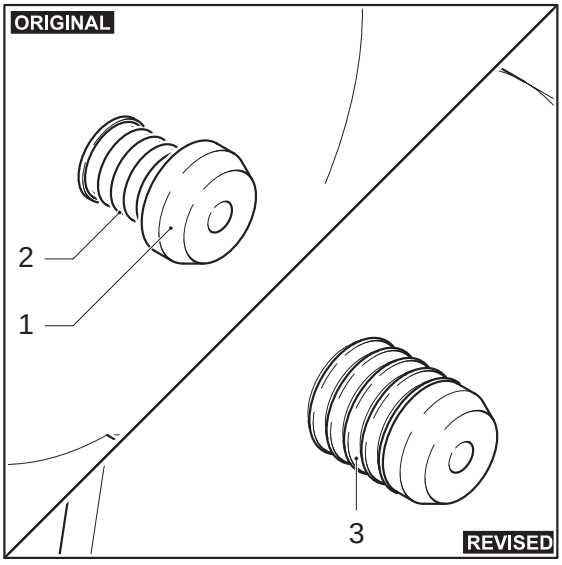
Excessive Unit Dusting



Lifting filter box



Replacing dust filter



Installing rubber sleeve

Replace dust filter

A noticeable deposit of dust at the impeller fan exhaust indicates a poorly installed or defective dust filter.

– Raise debris container (1) to half of its travel, and secure against dropping.
– Unsnap clip fasteners (2) on filter enclosure.
– Swing filter enclosure (3) forward, then lift off.
– Unfold hand grip (4), pull out, and unlock by means of a 90-degree turn.
– Remove old dust filter (5).
– Insert new dust filter (6).
– Return hand grip (4) to original position, and snap into place.
– Install filter enclosure (3), and lock clip fasteners (2).

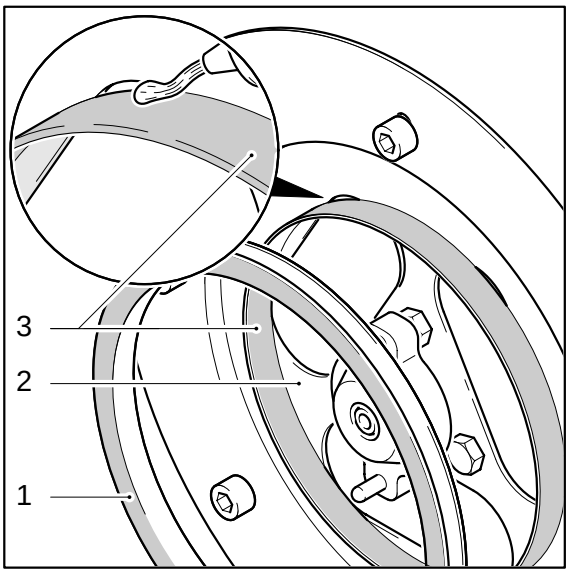
Check rubber sleeve

To prevent filter replacement problems caused by premature corrosion of the locator pin (7) in the filter receptacle, a rubber sleeve (9) was installed on units with S/N 10518 and up.

Defective or missing rubber sleeve (9) should be replaced or retrofitted (refer to service bulletin no. 1998-045).

1 Debris container
2 Filter enclosure clip fasteners
3 Filter enclosure
4 Hand grip
5/6 Replace dust filter
7 Locator pin
8 Compression spring
9 Rubber sleeve

Excessive Unit Dusting

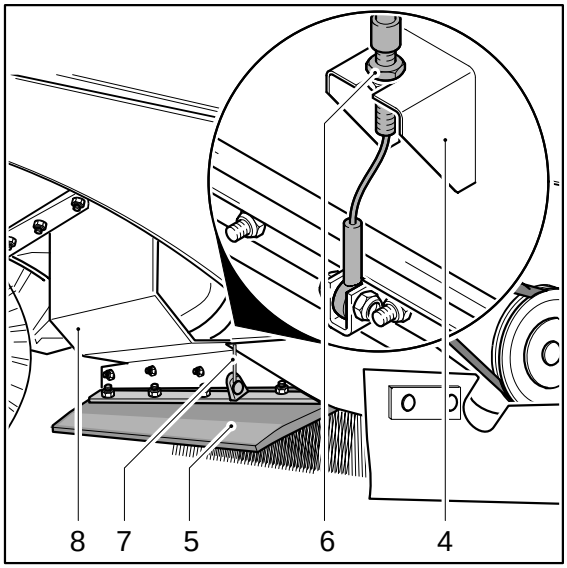


Sealing shaker motor flange

Check filter receptacle

A noticeable accumulation of dust in the engine compartment indicates a leaky filter receptacle. The seal ring (1) is defective or the three openings on flange (2) are too large, and protrude beyond the welded ring (3).

– Pull off seal ring (1), check and replace as required.
– To seal the openings, apply silicon sealer around the entire circumference outside the welded ring (3).
– Replace seal ring (1), ensure proper seating.



Coarse debris flap in open position

1 Seal ring
2 Flange assembly
3 Welded ring (mating rim for seal ring)
4 Retainer, control cable
5 Coarse debris flap
6 Adjusting screw, coarse debris flap
7 Control cable
5 Sheet metal guard

Check coarse debris flap

When the coarse dirt flap is open, the brush roller flings the dirt and dust away toward the front without sweeping it up.

The coarse debris flap (5) must open and shut easily. If required, clean the control cable (7), and lubricate with new grease (P/N 6.288-107) or spray in with teflon spray (P/N 6.288-125).

When opened, the gap of the coarse debris flap (5) should be at least 40 mm (1.58 in) wide. In its lowered state, it should trail by approx. 10 to 20 mm (0.40-0.80 in).

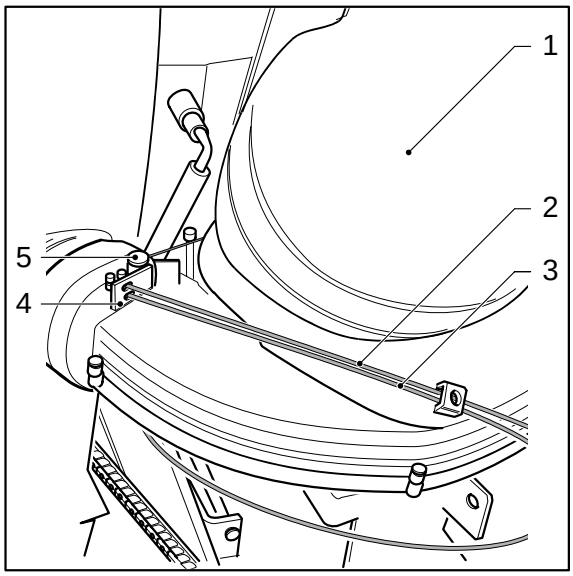
The coarse debris flap (5) is adjusted with the adjusting screw (6).

Note:
If the coarse debris flap trails excessively, it may get caught in the brush roller.

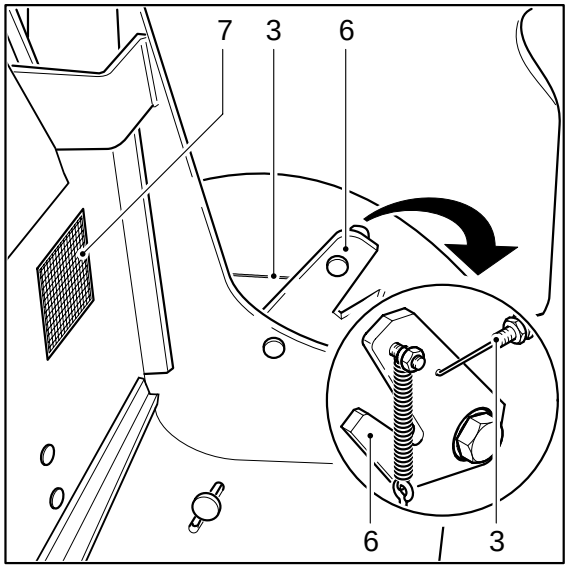
When replacing the control cable (7), care must be taken that the retainer (4) remains in the original horizontal position. This prevents the coarse debris flap from being pulled inward again after a short while, breaking the control cable as a result.

To straighten out the retainer (4) or to access the adjusting screw (6), the sheet metal guard (8) must be removed.

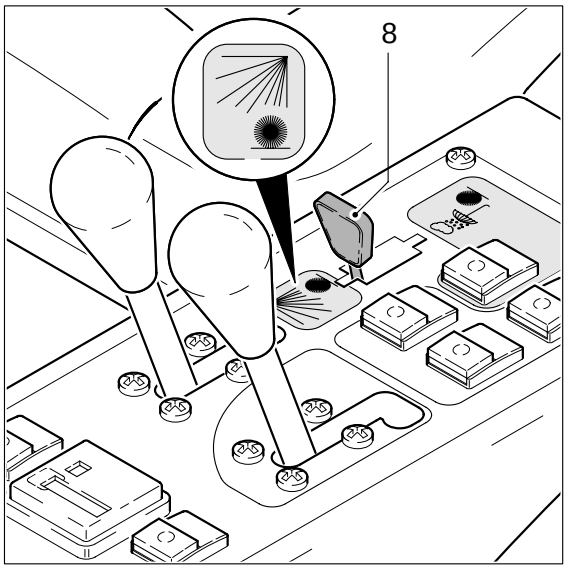
Excessive Unit Dusting



Dust pickup hatch



Container locking lever



Lever, dust pickup close / open

Check dust pickup

– When sweeping on dry ground, the hatch (4) will be opened with the lever (8) to allow air to enter the impeller fan.
– When sweeping on moist or wet ground, the hatch must be closed again to prevent moisture from entering the dust filter.
– When the sweeping debris container is raised, it also automatically closes the hatch (4). This prevents dust or objects to be drawn into the large open intake opening (7) in this state.

The right-hand side panel conceals a forked, spring-loaded lever (6). When lowered almost to the bottom position, the container presses the lever forward. This causes the container to be locked up in its end position so that it cannot swing out inadvertently during travel in mountainous terrain.

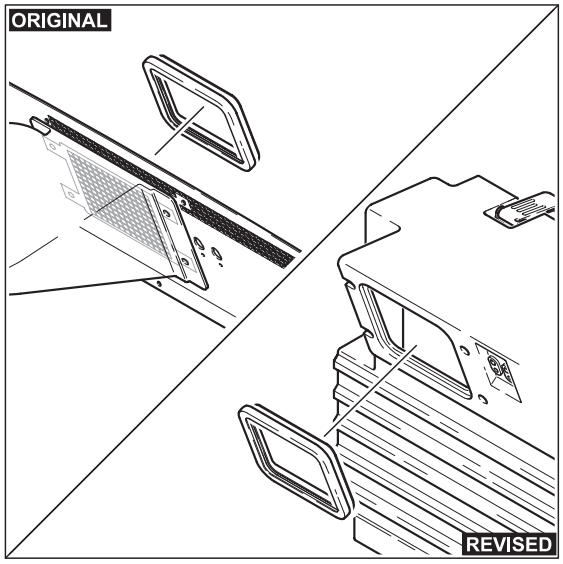
The control cable (3) for the hatch (4) is attached to the lever (6). Pressing the lever backward while raising the debris container closes the hatch. Pressing the lever forward while lowering the debris container causes the hatch (4) again to be opened by the coil spring (5).

Note:
When the lever is set to the “SUN” position (8), the hatch (4) must be fully open.

The lever (4) operating the hatch must travel easily enough to allow it to be opened by the coil spring (5) without problems.

1 Housing, impeller fan
2 Control cable connected from lever (8) on instrument panel to hatch (4)
3 Control cable connected from lever (6) to hatch (4)
4 Hatch
5 Coil spring
6 Debris container locking lever
7 Intake opening
8 Lever, dust pickup close / open

Excessive Unit Dusting

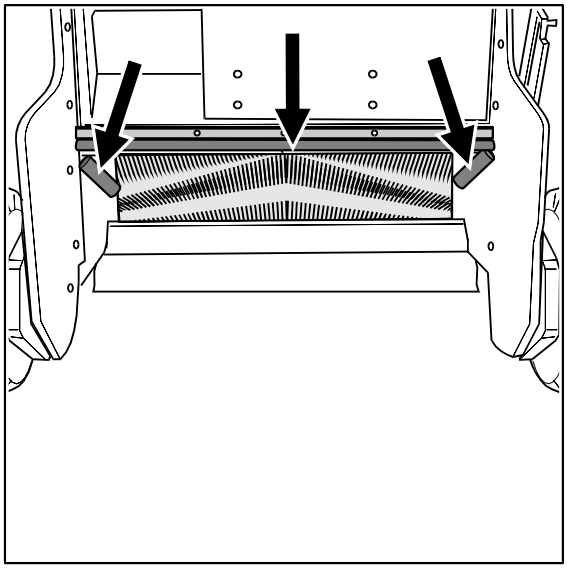


Seal on filter housing

Check seal on filter housing

Up until S/N 10033, the seal was applied to the impeller fan inlet. Later, in an effort to improve seal effectiveness, it was attached to the filter housing.

With the filter housing lowered, the seal must reliably seal off the transition to the housing.



Seals on brush well (rear view with raised container)

Check seals on brush well

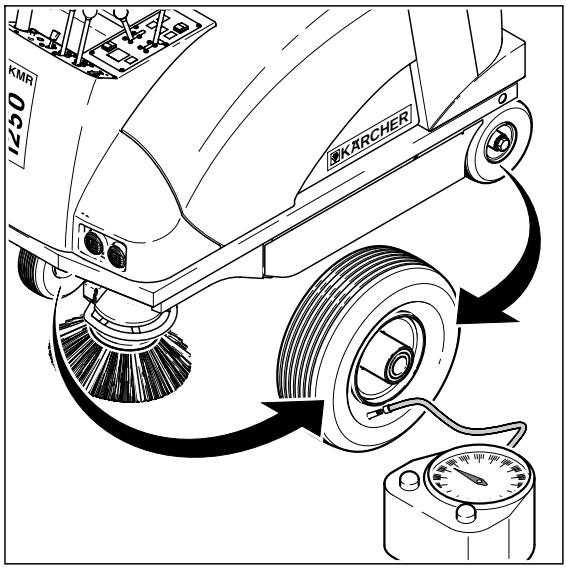
The three seals shown at left serve to seal off the brush roller well from the debris container.

The seals must be replaced as required.

Check impeller fan drive belt

The drive belt (see page 14 pos. 3) is elastic and cannot be adjusted.

Replace belt as required.



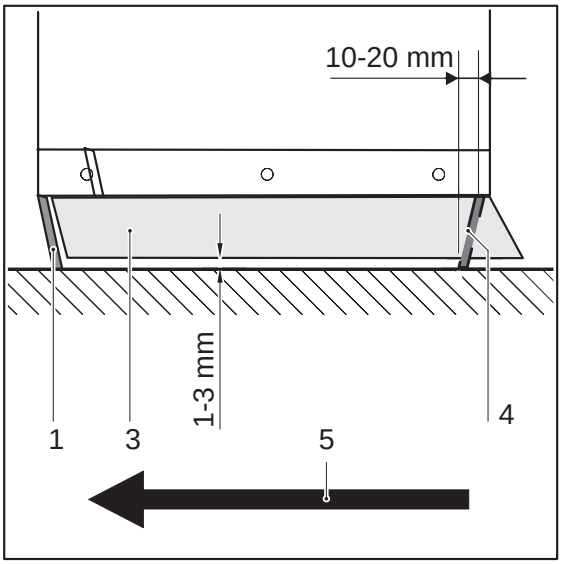
Checking tire pressure

Check tire pressure

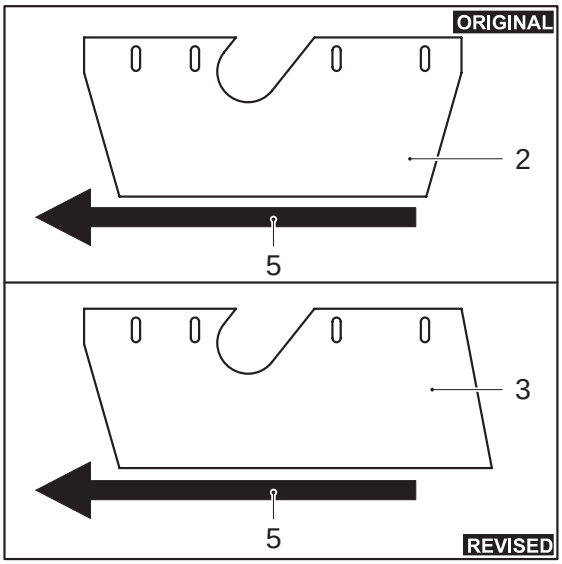
A too low tire pressure causes a sinking of the sealing lips and sealing strips and thus a worse sweeping result.

(See “Specifications” for tire pressures.)

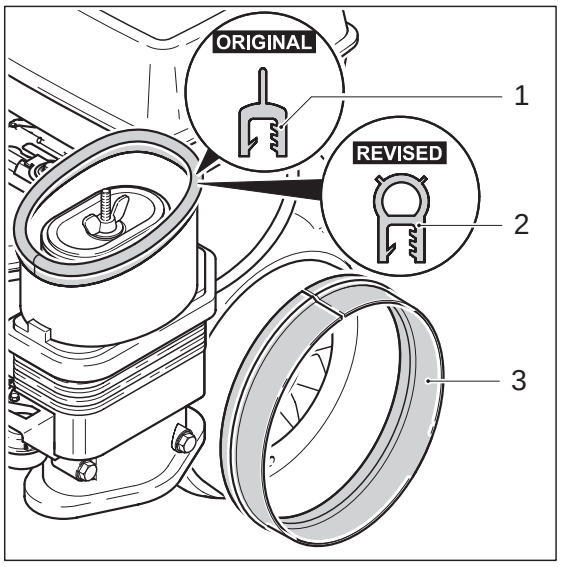
Excessive Unit Dusting



Adjusting sealing lips & sealing strips



Lateral sealing lip



Sealing lips, air intake

Adjust sealing lips / sealing strips in the sweeping area

The sealing lips and sealing strips serve essential functions. They maintain the vacuum level in the sweeping area required for proper functioning, ensuring dust-free sweeping operations at the same time. Damaged or worn sealing lips / sealing strips must be replaced.

– The front sealing lip (1) cannot be adjusted. If worn, it should be replaced as soon as possible.
– Adjust lateral sealing strips (3) to provide a ground clearance of approx. 1 to 3 mm (0.04-0.12 in).
– Adjust rear sealing lip (4) with an afterrunning clearance of approx. 10 to 20 mm (0.40-0.80 in).

Note:
Always consider the weight of the driver when doing setup work.

On original units, the lateral sealing lips (3) were cut in such a way that a gap existed between these and the rear sealing lip (4). It provided access for fine dust to be drawn into the engine compartment and engine proper, and enter the engine. Replace older sealing lips with new lateral sealing lips (4). They are cut differently at the back.

Check sealing lips at engine air intake

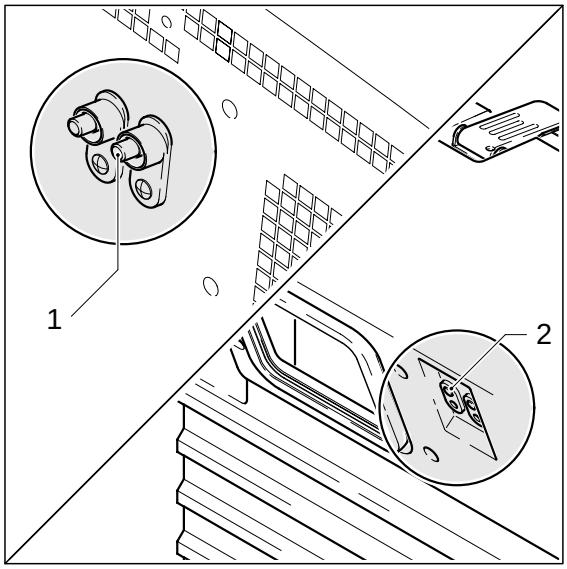
Together, the sealing lip (6 and 7) on the air-channel carburetor and the seal on the air channel blower provide dust-free air to be drawn into the engine.

The cross-section of the sealing lip (6 and 7) on the air-channel carburetor was optimized. Sealing strip must be checked for the new cross-section and possible damage, and must be replaced as required.

The seal (8) on the air-channel carburetor must be checked for damage and deformation, and replaced as required.

1 Front sealing lip
2 Lateral sealing strip ORIGINAL
3 Lateral sealing strip ORIGINAL
4 Rear sealing lip
5 Direction of motion
6 Sealing lip ORIGINAL, air-channel carburetor
7 Sealing lip REVISED, air-channel carburetor
8 Seal, air-channel blower

Filter cleaning Motor – No Function



Contact points filter housing

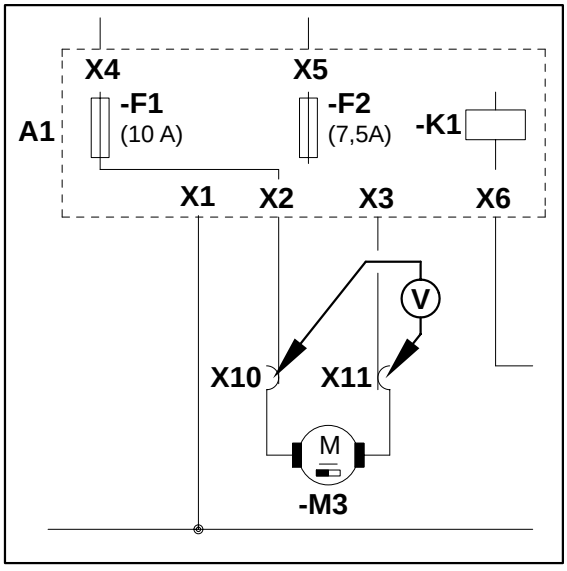
Check terminals (X 10 / X 11) in filter housing

Power for the filter cleaning motor is supplied via two spring-loaded contact terminals (1).

With the debris container lowered, spring-loaded contact points (1) mounted on the divider baffle must reliably make connection with rigid mating contacts (2) on debris container, being depressed by approx. 3 to 4 mm (0.12-0.16 in) in the process.

Clean contacts, adjust contact position by installing flat washers, or replace contacts as required.

1 Contacts on divider baffle, spring-loaded
2 Contact points on debris container, rigid

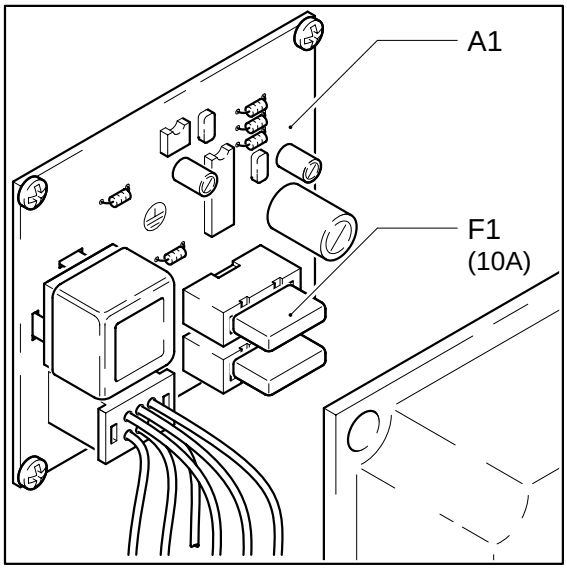


Checking M3 motor input voltage

Check input voltage at M3 filter cleaning motor

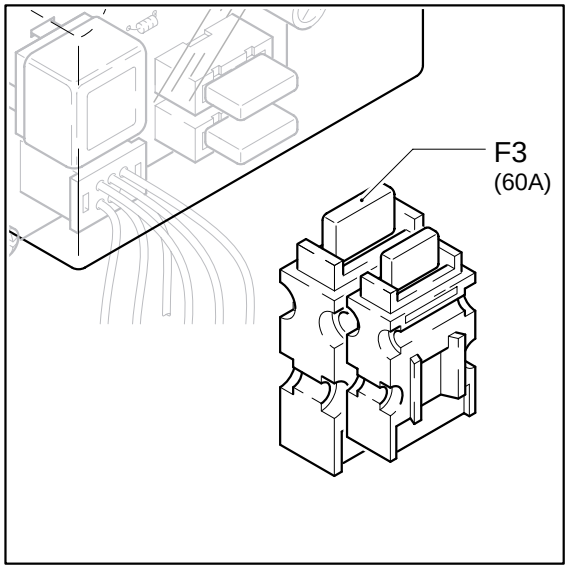
Each time ignition switch is set to “0” position, filter cleaning motor automatically runs for approx. 15 seconds. Pressing filter cleaning button while engine is running (ignition switch in “I” position) starts 15-second filter cleaning cycle. To prevent dislodged dust from being drawn into suction turbine, air flap must be closed beforehand.

– Raise debris container.
– Press filter cleaning button.
– Check voltage on contact terminals X10/X11.
– If there is no voltage present, start by checking fuse F1 (10 A) on A1 circuit board, then check terminals X2/X3.
– If a voltage is present without shaker motor running, check motor for ohmic resistance.

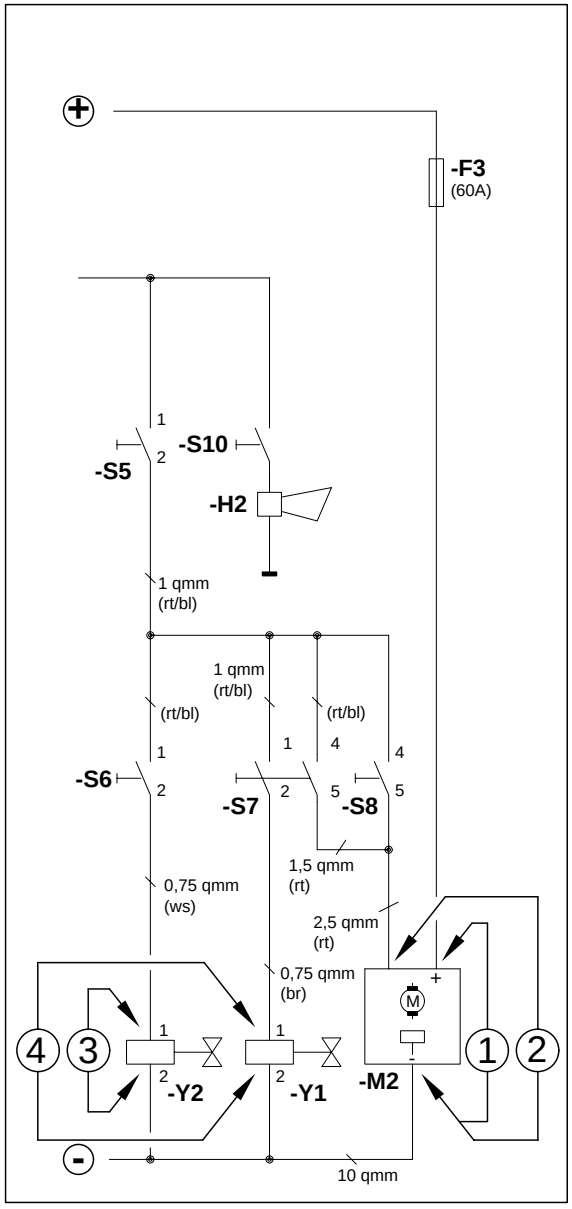


Fuse F1 (filter cleaning motor) on A1 circuit board

Hydraulic Unit – No Function



Checking F3 fuse



Checking voltage on hydraulic unit

Note:
Troubleshooting may proceed with engine shut off.

Check hydraulic unit

- Check F3 fuse. The F3 fuse protects only the hydraulic unit. It is located beneath the electrical box.
- Using a voltmeter, check input voltage of M2 hydraulic unit between thick red cable (positive polarity, 10 sq. mm cross-section) and matching black cable (negative polarity).
- Using the voltmeter, check input voltage on motor relay. Perform measurement with ignition switch set to position “I”.

  With buttons S5 and S8 actuated, control voltage must be present at relay.

If **measurements** removed components ① **and** ② produce a voltage reading but hydraulic motor is not running, the hydraulic unit is defective and must be replaced.

Note:
The wiring connections between relay and hydraulic motor are not shown in the electrical circuit diagram.

Check solenoid valves (Y1 / Y2)

Measurements ③ and ④: Using the voltmeter, check input voltage on solenoid valves Y1 and Y2 at connecting plug.

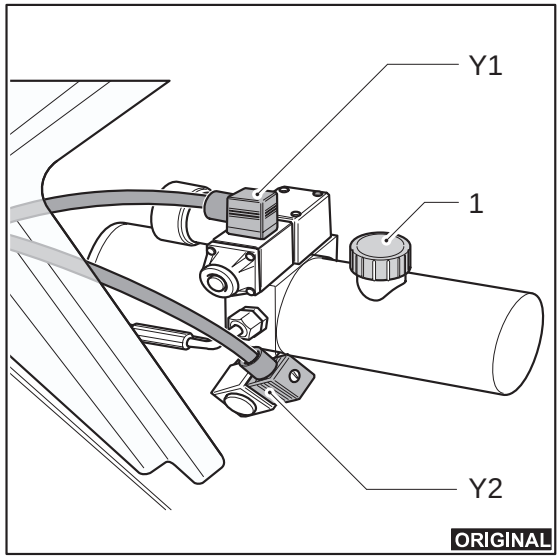
If voltage is present, solenoid valves will switch with an audible click.

If there is no voltage present, check power supply, vehicle ground connections and both buttons (S5 and S8) for proper functioning.

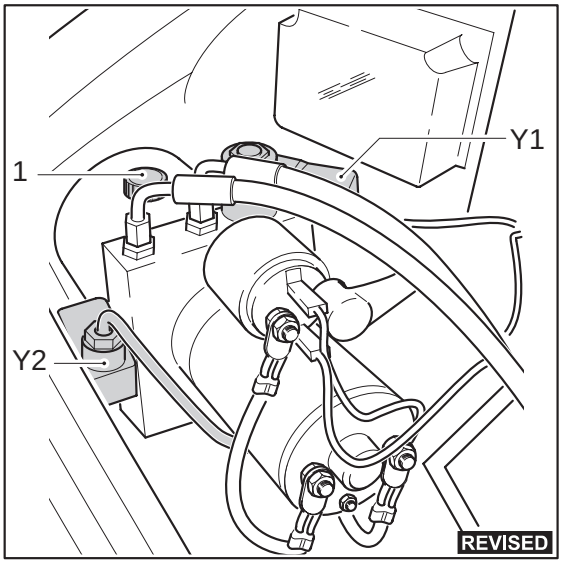
The solenoid valves are not available as spare parts. If a defect is found, the entire hydraulic assembly must be replaced.

F3 Fuse, hydraulic unit
M2 Hydraulic unit
S5 Button, Two-Hand Operation
S6 Button, Lower Debris Container
S7 Button, Tilt Debris Container
S8 Button, Raise Debris Container
Y1 Solenoid valve, Tilt Debris Container
Y2 Solenoid valve, Raise / Lower Container

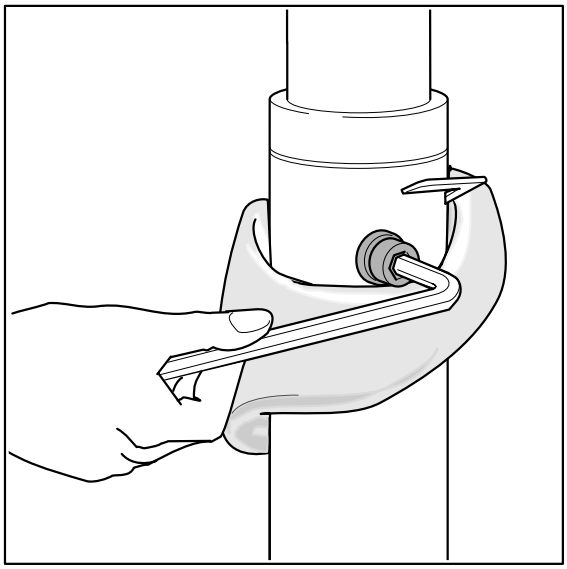
Debris Container – Very Slow Ascent



Hydraulic unit



Hydraulic unit



Bleeding (purging) air from lifting cylinder

Check hydraulic unit

By contamination within the hydraulic system, the debris container can no longer be raised after a brief operating period. The fine orifices in the hydraulic unit are blocked.

As the hydraulic unit is maintenance-free and should not be opened. It must be replaced as an assembly if required.

With the debris container lowered, the hydraulic fluid level should be approx. 2 to 3 cm (0.80-1.18 in) below the edge of the filler neck.

Note:
Extremely clean working conditions and work habits are a prerequisite for working on the hydraulic system.

After a replacement, all hydraulic system components automatically purge themselves when the raising mechanism is actuated repeatedly. As a result, only the lifting cylinder must be purged separately.

1 Hydraulic fluid filler neck
Y1 Solenoid valve, Tilt Container
Y2 Solenoid valve, Raise / Lower Container

Check hydraulic fluid

When the unit is cold, the use of nonstandard hydraulic fluid will cause the debris container to be raised only very slowly.

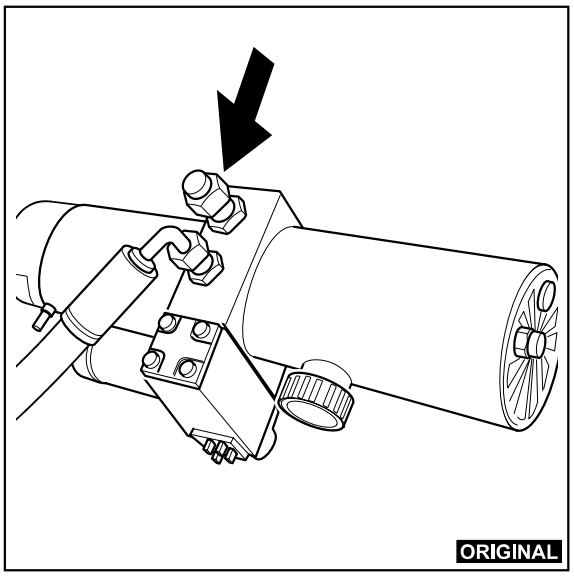
The correct choice of hydraulic fluid (see “Specifications”) facilitates working at temperatures to -10 °C (14 °F) without difficulty.

Purge lifting cylinder

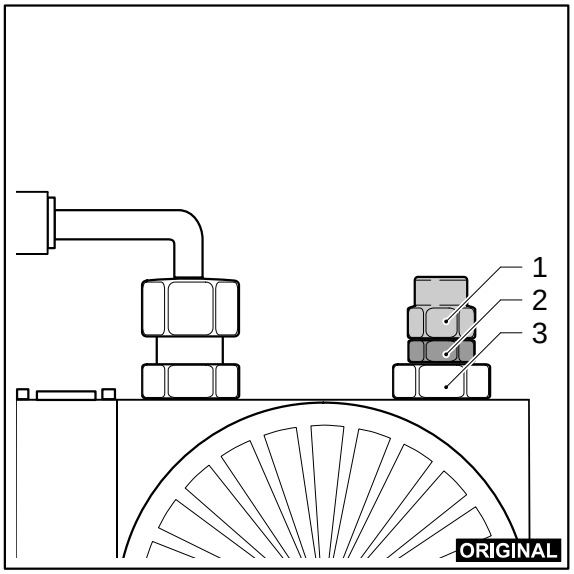
– Raise container to the top position, and support to prevent inadvertent descent.
– Press Raise Container button again, while at the same time cracking the purge screw on the lifting cylinder. When all air has escaped and hydraulic fluid exits without bubbles, tighten purge screw.
– Wipe up hydraulic fluid runoff, and check fluid level in reservoir.

DANGER – FATAL INJURY HAZARD
Raised container must be reliably supported while personnel is working underneath.

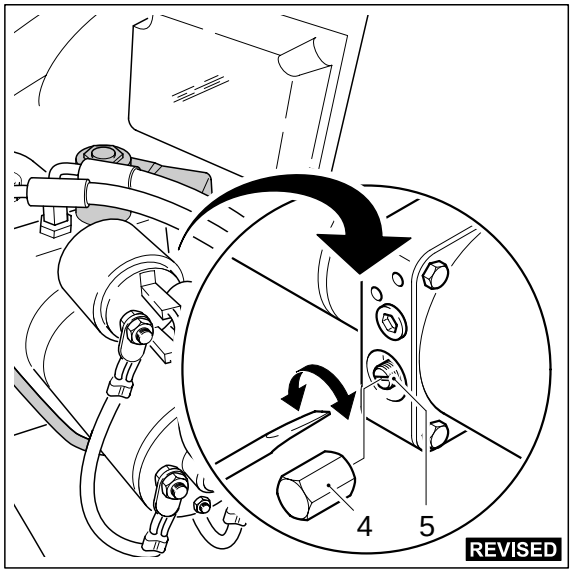
Debris Container – No Full Ascent



Hydraulic unit w/ pressure relief valve



Adjusting pressure relief valve



Adjusting pressure relief valve

Adjust pressure relief valve

Raise empty or full debris container to maximum attainable height **(two-hand operation)**. In this position hold on the two buttons and measure the current draw of the hydraulic unit (see "technical specification"). The current draw provides a measure of the opening pressure set on the pressure relief valve.

Hydraulic unit,
adjust pressure relief valve ORIGINAL

– Remove hydraulic unit **but do not disconnect hydraulic hoses**.
– Holding valve insert (3) with wrench, unscrew cap of pressure relief valve (1). The cap conceals the valve adjusting screw.
– Continue to hold valve insert (3) with wrench, loosen lock nut (2) on valve adjusting screw.
– Using a flat screwdriver, turn adjusting screw:

  One-half CW turn increases current draw by roughly 4 to 5 A (approx. 10 bar, approx. 145 psi).
– Finish by tightening lock nut on adjusting screw, again installing screw cap (1).
– Install hydraulic unit: Perform function test, and measure current draw.

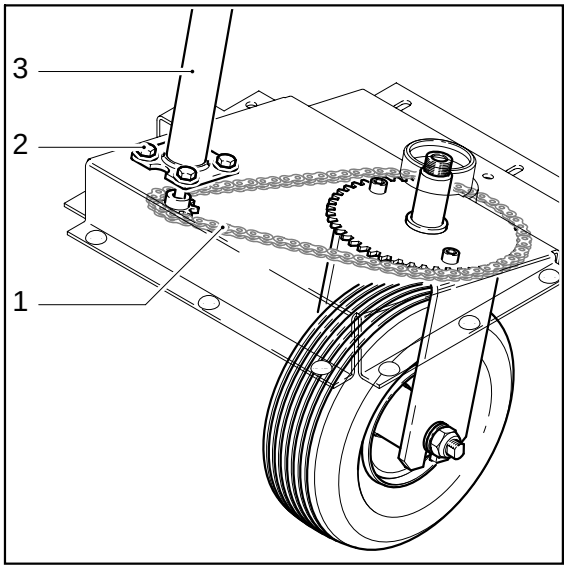
Hydraulic unit,
adjust pressure relief valve REVISED

– Remove hydraulic unit **but do not disconnect hydraulic hoses**.
– Remove screw cap (4). Cap conceals adjusting screw (5).
– Using a stubby screwdriver, turn adjusting screw:

  One-half CW turn increases current draw by roughly 4 to 5 A (approx. 10 bar, approx. 145 psi).
– Finish by installing screw cap (4).
– Install hydraulic unit: Perform function test, and measure current draw.

1 Cap
2 Lock nut
3 Valve insert
4 Screw cap
5 Adjusting screw

Excessive Steering Free Play



Adjusting steering free play

1 Steering chain
2 Mounting bolts w/ nuts
3 Steering column (shaft inside)

Adjust steering free play

Wear and tear and stretching of the steering chain (1) may cause excessive steering free play.

If steering free play becomes too large, the steering chain must be tighted, replaced as required

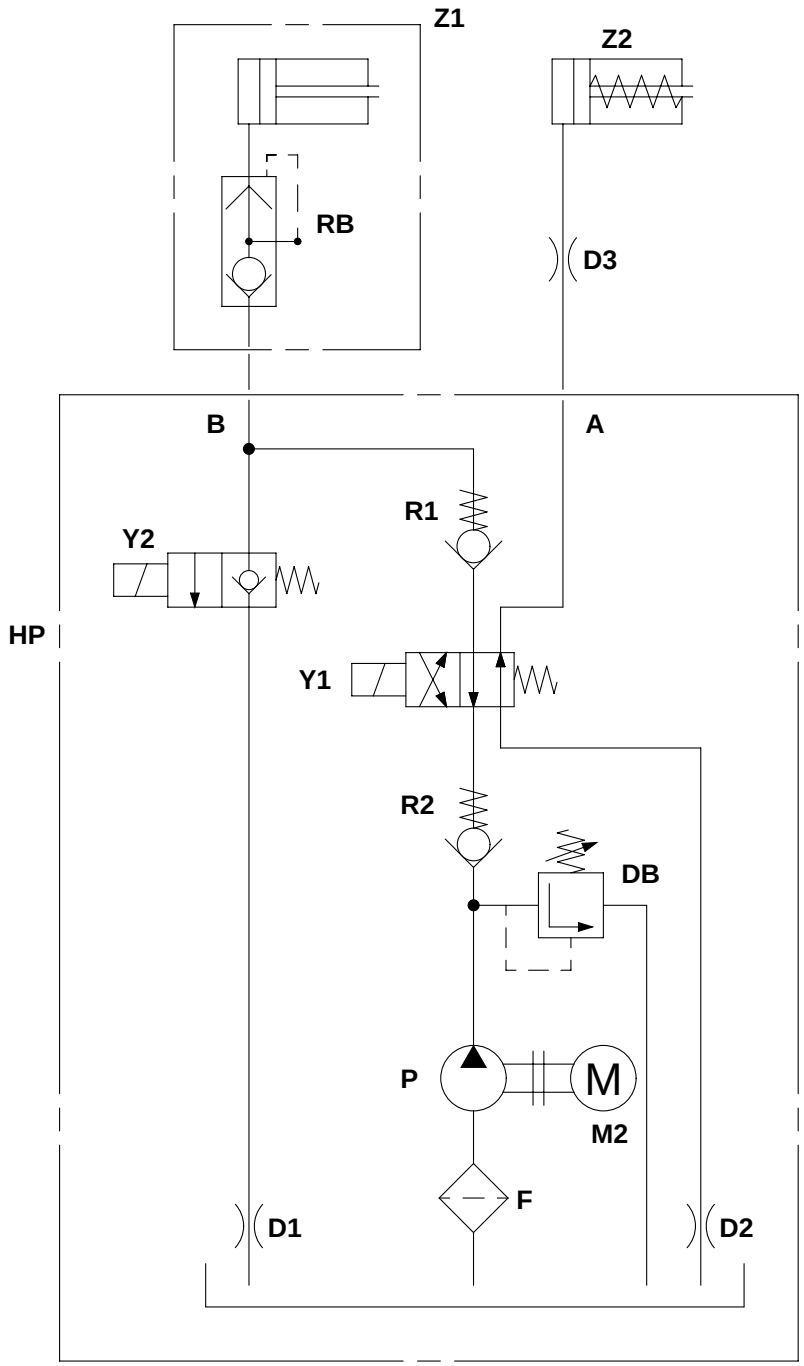
Tighten steering chain

– Loosen nuts of mounting bolts (2), and tighten chain (1) by shifting steering column (3) in elongated holes.
– Retighten mounting nuts.

Replace chain

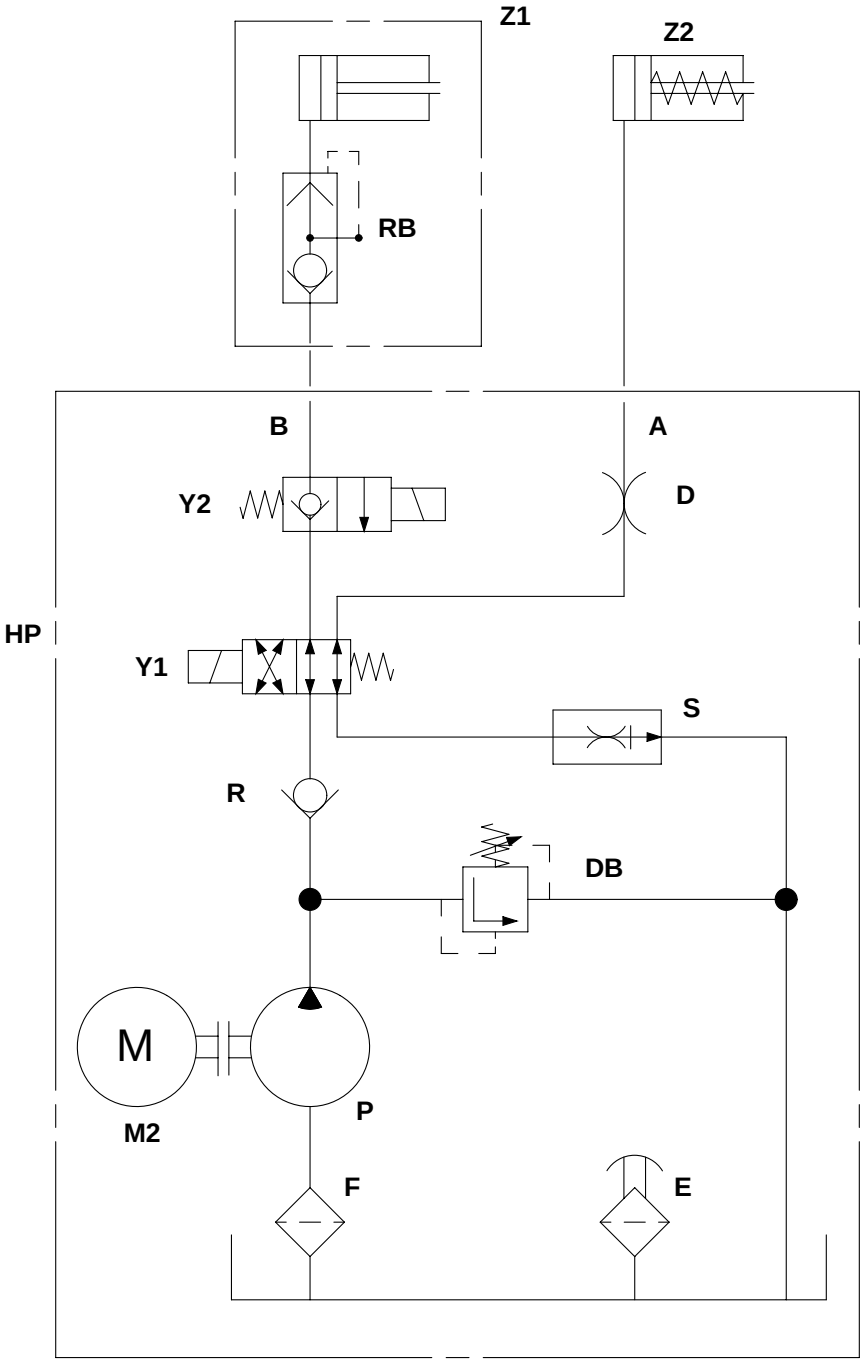
– Loosen nuts of mounting bolts (2), and shift steering column (3) in elongated holes far enough to allow removal of steering chain (1).
– Install new steering chain, ensuring that front wheel points straight ahead when steering wheel is in center (non-deflected) position.
– Tighten chain (1) by shifting steering column (3) in elongated holes.
– Retighten mounting nuts

Hydraulic Block Diagram 0.087-964 ORIGINAL through S/N 10441



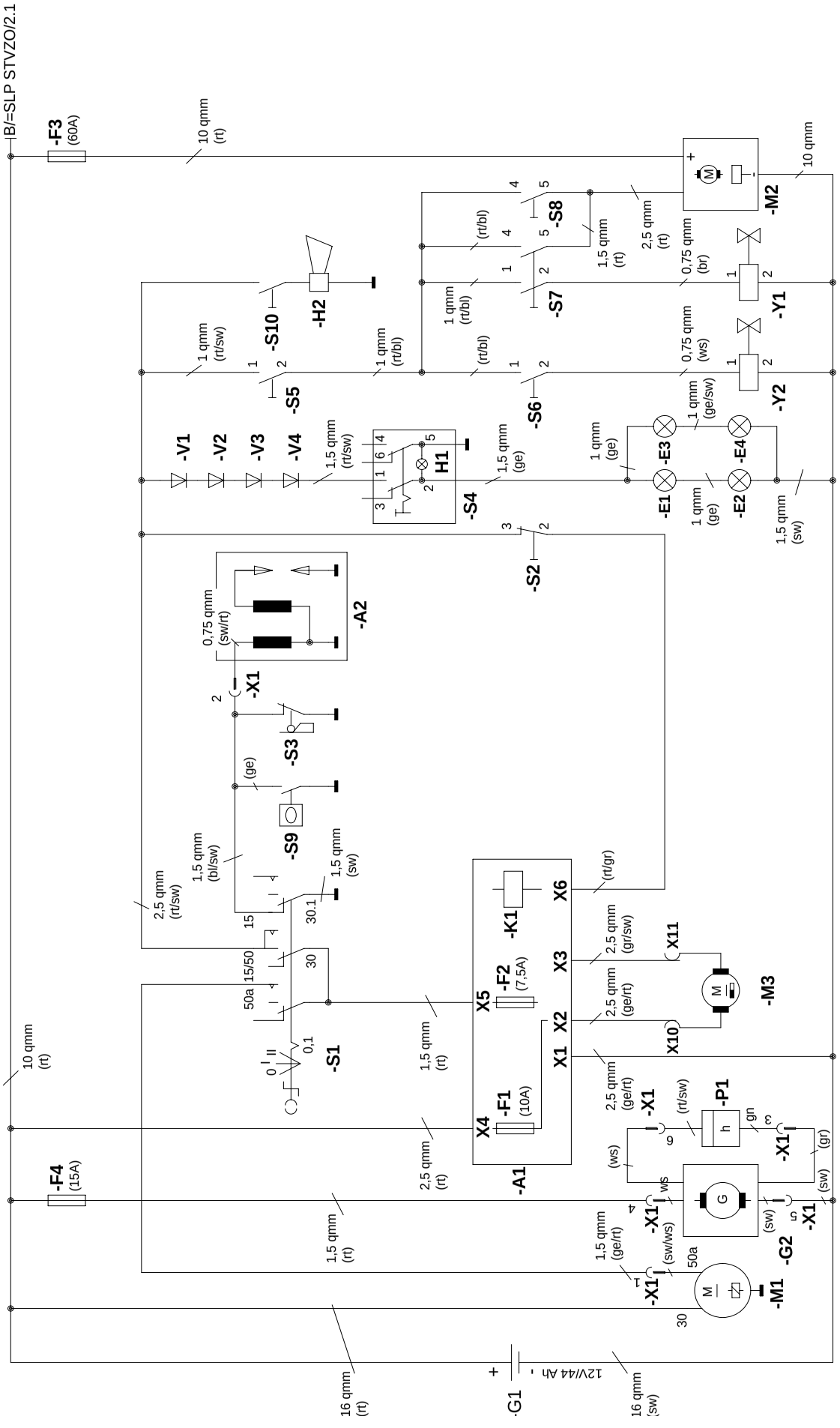
A, B	Pressure connection, hydraulic unit
D1	Throttle valve
D2	Throttle valve
D3	Throttle valve
DB	Pressure relief valve
HP	Hydraulic unit
M2	Electric motor, hydraulic unit
P	Hydraulic pump
R1/R2	Non-return valve
RB	Pipe-break valve
Y1	Solenoid valve – Tilt debris container
Y2	Solenoid valve – Raise/Lower debris container
Z1	Lifting cylinder
Z2	Tilting cylinder w/ gas strut damper

Hydraulic Block Diagram 0.088-234 REVISED from S/N 10442



A, B	Pressure connection, hydraulic unit
D	Throttle valve
DB	Pressure relief valve
E	Filler / purge screw
F	Filter
HP	Hydraulic unit
M2	Electric motor, hydraulic unit
P	Hydraulic pump
R	Non-return valve
RB	Pipe-break valve
S	Throttle valve
Y1	Solenoid valve – Tilt debris container
Y2	Solenoid valve – Raise/Lower debris container
Z1	Lifting cylinder
Z2	Tilting cylinder w/ gas strut damper

Electrical Circuit Diagram 0.087-963 (KMR 1250 B)



Note: Unmarked wiring has cross-section of .75 sq. mm

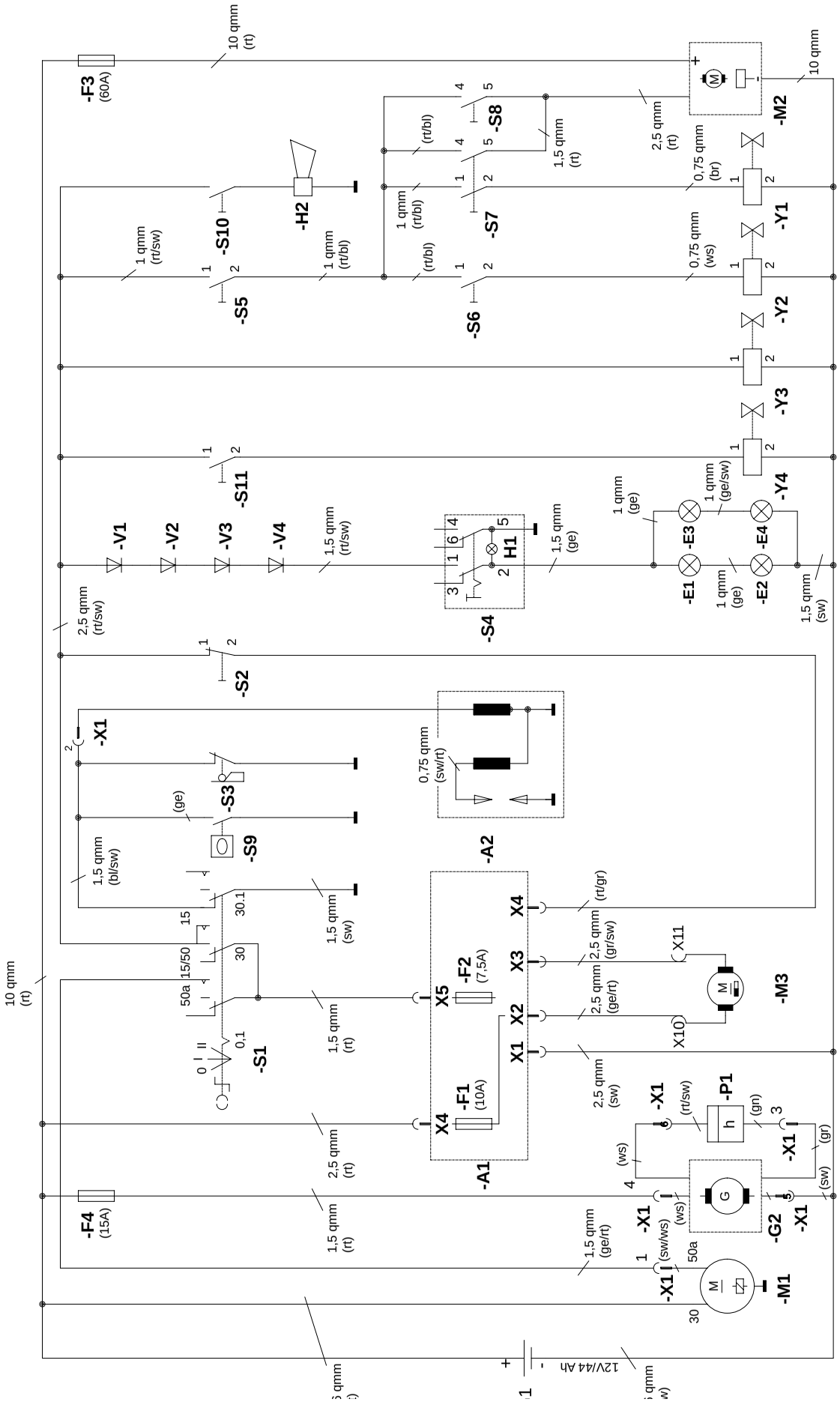
Electrical Circuit Diagram 0.087-963 (KMR 1250 B)

A1	Filter cleaning control
A2	Ignition
E1-E4	Headlights
F1	Fuse - Filter cleaning motor
F2	Fuse - control voltage
F3	Fuse - Hydraulic unit
F4	Fuse - Alternator
G1	Battery
G2	Alternator
H1	Indicator lamp - Headlights
H2	Horn
K1	Relay - filter cleaning motor
M1	Starter
M2	Hydraulic unit
M3	Filter cleaning motor
P1	Operating hours counter
S1	Ignition switch
S2	Button - Filter cleaning
S3	Switch - Seat contact
S4	Switch - Headlights
S5	Button - Hydraulics
S6	Button - Lower Container
S7	Button - Tilt Container
S8	Button - Raise Container
S9	Oil level switch
S10	Button - Horn
V1-V4	Diode
X1	Plug, 6-pin
X10/11	Contacts - Filter cleaning motor
Y1	Solenoid valve - Tilt debris container
Y2	Solenoid valve - Raise / Lower debris container

○	Detachable wiring connection
≠	Graphic symbol for wiring connection
⊥	Vehicle earth/ground
⅄	Female coupling (X1 connecting plug)
⅂	Male coupling (X1 connecting plug)

bl	=	blue
bn	=	brown
ge	=	yellow
gr	=	grey
gn	=	green
rt	=	red
or	=	orange
rs	=	rose (pink)
sw	=	black
ws	=	white

Electrical Circuit Diagram 0.088-151 (KMR 1250 LPG)



Note: Unmarked wiring has cross-section of .75 sq. mm

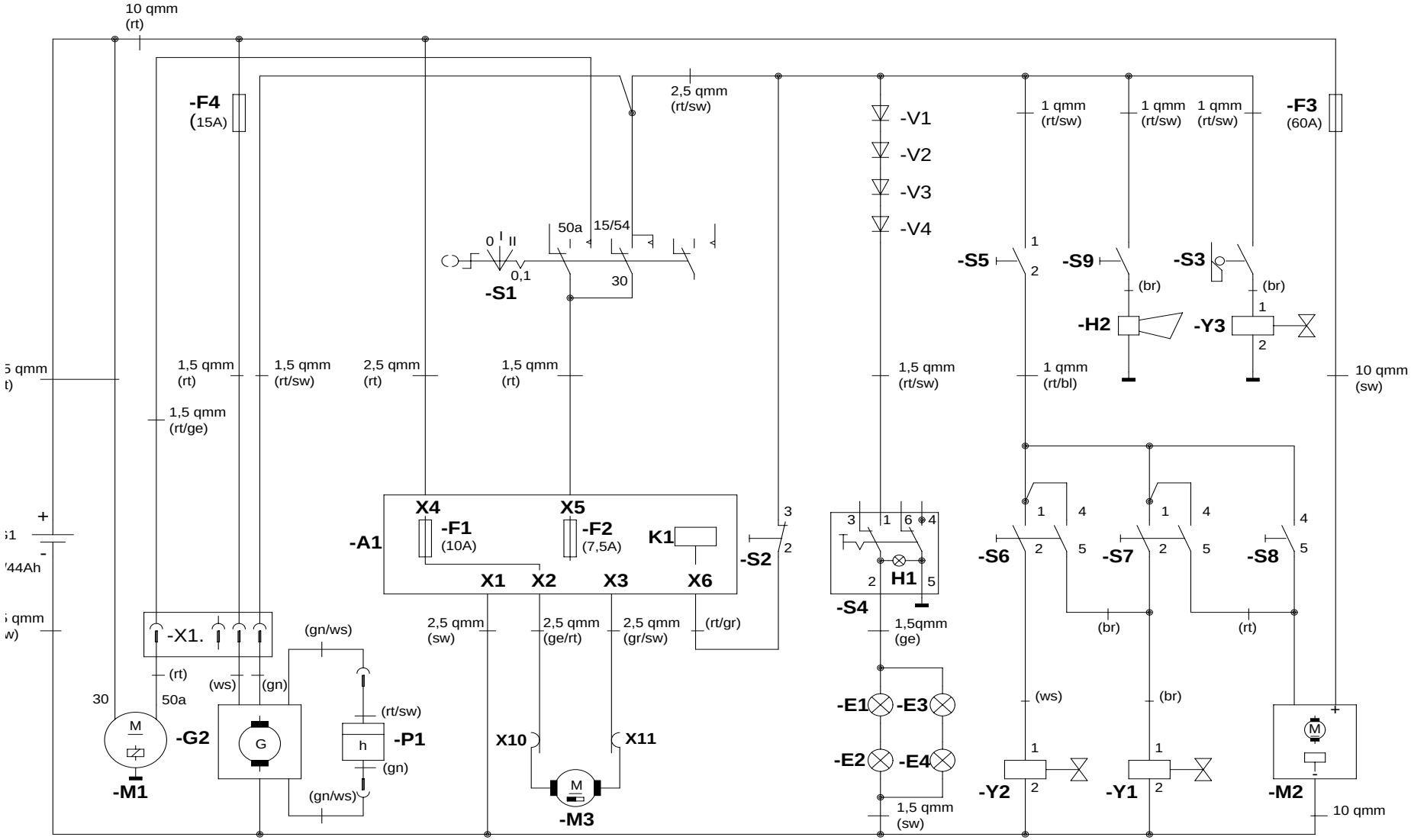
Electrical Circuit Diagram 0.088-151 (KMR 1250 LPG)

A1	Filter cleaning control
A2	Ignition
E1-E4	Headlights
F1	Fuse - Filter cleaning motor
F2	Fuse - control voltage
F3	Fuse - Hydraulic unit
F4	Fuse - Alternator
G1	Battery
G2	Alternator
H1	Indicator lamp - Headlights
H2	Horn
M1	Starter
M2	Hydraulic unit
M3	Filter cleaning motor
P1	Operating hours counter
S1	Ignition switch
S2	Button - Filter cleaning
S3	Switch - Seat contact
S4	Switch - Headlights
S5	Button - Hydraulics
S6	Button - Lower Container
S7	Button - Tilt Container
S8	Button - Raise Container
S9	Oil level switch
S10	Button - Horn
S11	Button - Choke
V1-V4	Diode
X1	Connecting plug, 6-pin
X10/11	Contacts - Filter cleaning motor
Y1	Solenoid valve - Tilt debris container
Y2	Solenoid valve - Raise / Lower debris container
Y3	Solenoid valve - Fuel shutoff valve
Y4	Choke lifting solenoid

○	Detachable wiring connection
≠	Graphic symbol for wiring connection
⊥	Vehicle earth/ground
⅄	Female coupling (X1 connecting plug)
⅂	Male coupling (X1 connecting plug)

bl	=	blue
bn	=	brown
ge	=	yellow
gr	=	grey
gn	=	green
rt	=	red
or	=	orange
rs	=	rose (pink)
sw	=	black
ws	=	white

Electrical Circuit Diagram 0.088-097 (KMR 1250 D)



Note: Unmarked wiring has cross-section of .75 sq. mm

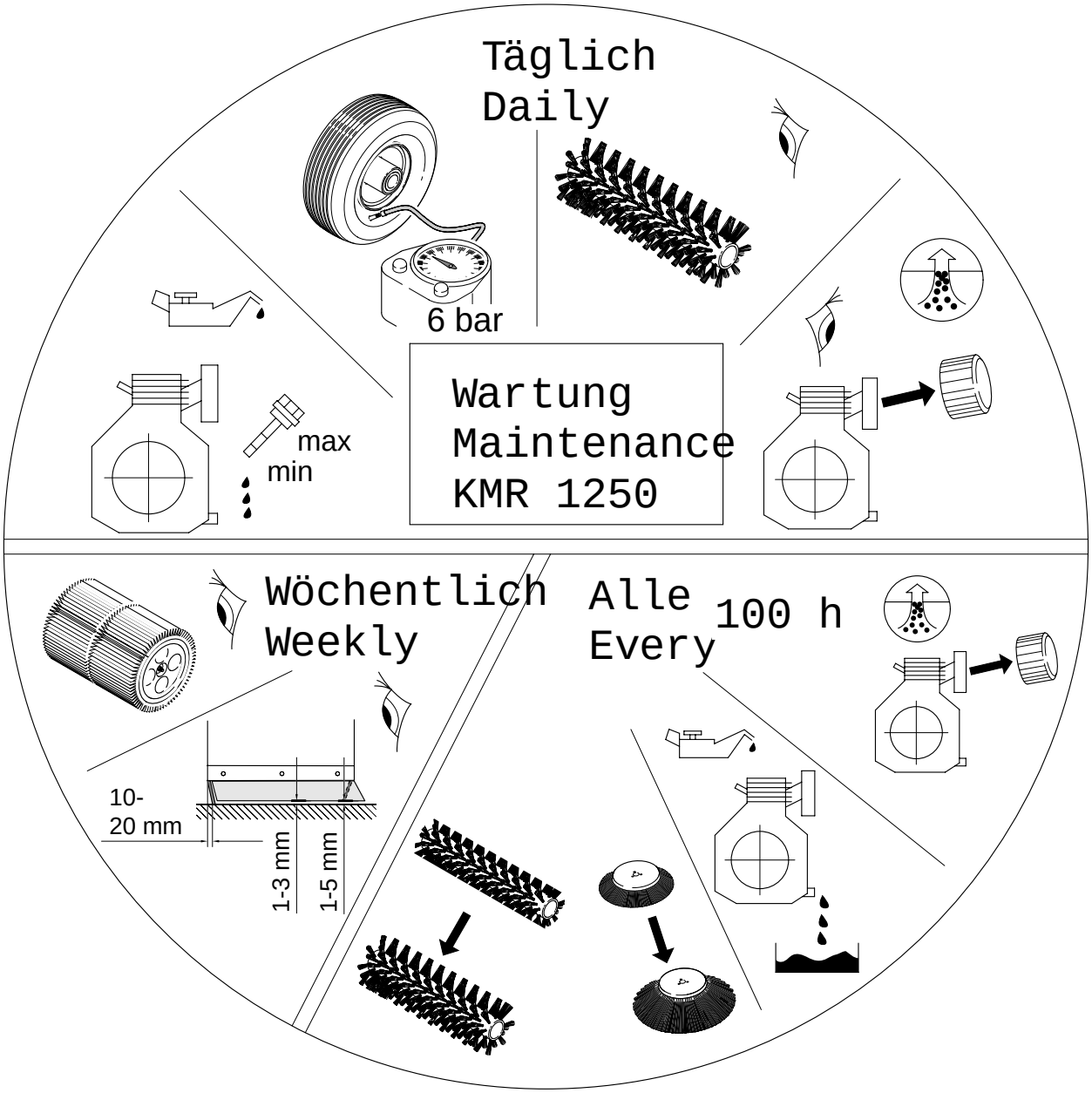
Electrical Circuit Diagram 0.088-097 (KMR 1250 D)

A1	Filter cleaning control
A2	Ignition
E1-E4	Headlights
F1	Fuse – Filter cleaning motor
F2	Fuse - control voltage
F3	Fuse – Hydraulic unit
F4	Fuse – Alternator
G1	Battery
G2	Alternator
H1	Indicator lamp – Headlights
H2	Horn
M1	Starter
M2	Hydraulic unit
M3	Filter cleaning motor
P1	Operating hours counter
S1	Ignition switch
S2	Button – Filter cleaning
S3	Switch – Seat contact
S4	Switch – Headlights
S5	Button – Hydraulics
S6	Button – Lower Container
S7	Button – Tilt Container
S8	Button – Raise Container
S9	Button – Horn
V1-V4	Diode
X1	Connecting plug, 4-pin
X10/11	Contacts – Filter cleaning motor
Y1	Solenoid valve – Tilt Container
Y2	Solenoid valve – Raise/Lower Contain
Y3	Solenoid valve – Fuel shutoff valve

○	Detachable wiring connection
≠	Graphic symbol for wiring connection
⊥	Vehicle earth/ground
⅄	Female coupling (X1 connecting plug)
⅂	Male coupling (X1 connecting plug)

bl	=	blue
bn	=	brown
ge	=	yellow
gr	=	grey
gn	=	green
rt	=	red
or	=	orange
rs	=	rose (pink)
sw	=	black
ws	=	white

Maintenance Procedures for B, LPG & D Models



Maintenance intervals

Maintenance procedures are performed at the following intervals:

Daily by operator

- Check oil level
- Check tire pressure
- Check brush roller for wear and snagged strings, banding, etc.
- Check air cleaner/filter for damage

Weekly by operator

- Check sealing lips in sweeping system for wear and proper adjustment

Every 100 hours

- Check air cleaner/filter for damage
- Change engine oil
- Check brush roller and side brushes for wear, and replace as required.

By service specialist

- after 8 hours
- every 100 hours
- every 300 hours
- every 500 hours
- every 1000 hours

(Refer to table on opposite page.)

Maintenance Procedures for B, LPG & D (after operating hours)

Maintenance procedures	8	100	200	300	400	500	600	700	800	900	1000
Engine oil - check	O	O	O	O	O	O	O	O	O	O	O
Main drive belt tension - check	O	O	O	O	O	O	O	O	O	O	O
Main drive belt - replace						O					O
Engine air cleaner - clean / replace	O	O	O	O	O	O	O	O	O	O	O
Drive chains - check for wear and tension		O	O	O	O	O	O	O	O	O	O
Cooling air intake - check seal		O	O	O	O	O	O	O	O	O	O
Spark plugs - check / clean (B and LPG only)		O	O	O	O	O	O	O	O	O	O
Spark plugs - replace (B and LPG only)				O			O			O	
Fuel sediment cup - clean (B only)		O	O	O	O	O	O	O	O	O	O
LP gas cylinder - check; connect-ion must point up (LPG only)		O	O	O	O	O	O	O	O	O	O
LP gas system - check for leaks (LPG only)		O	O	O	O	O	O	O	O	O	O
Tire pressure - check		O	O	O	O	O	O	O	O	O	O
Hydraulic hoses - check		O	O	O	O	O	O	O	O	O	O
Hydraulic system fluid level - check		O	O	O	O	O	O	O	O	O	O
Control cables & all moving parts - check for easy travel		O	O	O	O	O	O	O	O	O	O
Unit drive system functions - check (forward, reverse, freewheeling)		O	O	O	O	O	O	O	O	O	O
Parking brake function - check		O	O	O	O	O	O	O	O	O	O
Debris container functions - check		O	O	O	O	O	O	O	O	O	O
Debris container seals - check		O	O	O	O	O	O	O	O	O	O
Filter shaker function - check		O	O	O	O	O	O	O	O	O	O
Dust filter - check / replace		O	O	O	O	O	O	O	O	O	O
Sealing strips in sweeping system - check for adjustment & wear		O	O	O	O	O	O	O	O	O	O
Coarse-dirt hatch function - check		O	O	O	O	O	O	O	O	O	O
Brush roller & side brushes - check		O	O	O	O	O	O	O	O	O	O
Sweeping pattern, main brush roller & side brushes - check		O	O	O	O	O	O	O	O	O	O
Exhaust system - check		O	O	O	O	O	O	O	O	O	O
Vehicle lighting - check		O	O	O	O	O	O	O	O	O	O
Live electrical wiring and contact points - check		O	O	O	O	O	O	O	O	O	O
Fuel filter - change (B and LPG only)				O			O			O	
Valve clearance - check				O			O			O	
Drive chains - replace											O
CO emissions - check / analyze (LPG only)											O

Technical specifications

Service weight (operational)	420	kg	
Permitted gross weight	600	kg	
Length	1650	mm /	64.96 in
Width	1000	mm /	39.37 in
Height	1270	mm /	50 in
Driving speed, forward, max.	7 - 8	km/h	
Driving speed, reverse, max.	4 - 6	km/h	
Climbing ability, max.	18	%	
Width, sweeping path w/o side brush	750	mm /	29.53 in
Width, sweeping path w/ 1 side brush	1000	mm /	39.97 in
Width, sweeping path w/ 2 side brushes	1300	mm /	51.18 in
Debris container, usable capacity, max.	80	l	
Debris container, lifting height (min.)	1400	mm /	55.12 in
Debris container, surface area, dust filter	6	m^2	
Debris container, lifting weight	105–115	kg	
Debris container, filter cleaning cycle (after-running time)	10–15	sec	
Main brush, ground clearance, raises	10	mm /	0.39 in
Sweeping pattern, width	30 - 50	mm /	1.17-1.95 in
Main brush, diameter	285	mm /	11.22 in
Main brush, speed (at engine operating speed)	560–580	RPM	
Side brush, diameter	450	mm /	17.72 in
Side brush, speed (at engine operating speed)	57–63	RPM	
Coarse dirt flap, raised (min.)	50	mm /	1.95 in
Coarse dirt flap, after-running	10 - 20	mm /	0.39-0.78 in
Side sealing strips, ground clearance	1 - 3	mm /	0.04-0.12 in
Rear selling strip, after-running	10 - 20	mm /	0.39-0.78 in
Tires, diameter	300	mm /	11.81 in
Tires, designation	4.00-4	GPR	
Tire pressure, front	6	bar	87 psi
Tire pressure, rear	6	bar	87 psi
Tires, torque, wheel stud make-up	44	Nm	
Fuses, filter cleaning motor (F1)	10	A	
Fuses, control voltage (F2)	7,5	A	
Fuses, hydraulic motor (F3)	60	A	
Fuses, generator (F4)	15	A	
Steering, turns, full LH / RH deflection	$1^3/_4$		
Steering free play (on steering wheel, max.)	5°		
Parking brake, brake lever, tension at spring (at hydrostatic drive)	5 - 10	mm /	0.20-0.39 in
Impeller fan, vacuum with closed suction hose	10 - 12	mbar /	0.1-0.2 psi

Technical specifications

Engine, KMR 1250 B / LPG (P/N 6.491-573)

Designation	HONDA GX 270	
Type	4-Stroke	
No. of cylinders	1	
Displacement	270	cm^3
Drive belt engine, clearance with 20 N	3 - 8	mm / 0.12-0.32 in
Operating speed	2.600 - 2.700	RPM
Idle speed	1.250 - 1.550	RPM
Output (9 bhp at 3600 RPM)	6,6	kW
fuel tank capacity (standard grade, lead-free gasoline)	6	l
Engine oil capacity (SAE 15 W 40)	1,1	l
Battery, maintenance-free	12 V / 44	Ah
Starter	electrical	
Exhaust value	0,5	%

Engine, KMR 1250 D (P/N 6.491-604)

Designation	YANMAR L 70 AE-DE	
Type	4-Stroke	
No. of cylinders	1	
Displacement	270	cm^3
Drive belt engine, clearance with 20 N	3 - 8	mm / 0.12-0.32 in
Operating speed	2.600 - 2.700	RPM
Idle speed	1.250 - 1.550	RPM
Output (9 bhp at 3600 RPM)	6,6	kW
fuel tank capacity (Diesel)	6	l
Engine oil capacity (SAE 15 W 40)	1,1	l
Battery, maintenance-free	12 V / 44	Ah
Starter	electrical	

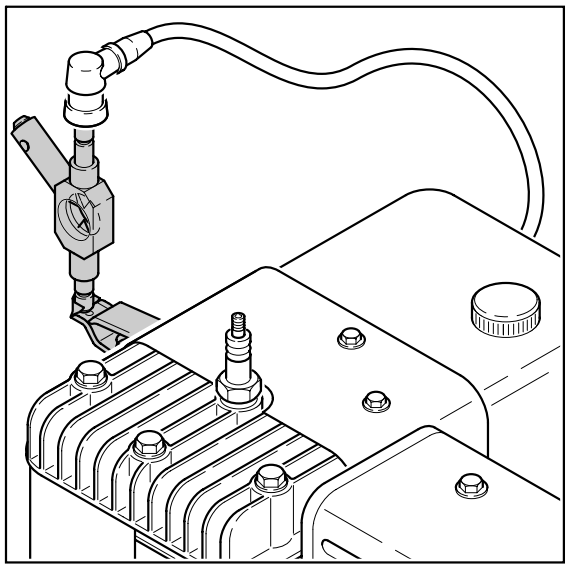
Hydraulic unit

Class, hydraulic fluid	DIN HVLP 51524/2	
Type, hydraulic fluid	HV 46	
System capacity	1,5	l
Protection category	splash-water protected	
Current draw, hydraulic motor, max. (Current draw of 70 A permits lifting container loadoff approx. 105–115 kg.)	70	A

Noise level

Measured in accordance with DIN 45 635 T36 and DIN 45 648 standards at operating speed of 2700 RPM, subjective reading at operator position is 79,5 dB(A).

Special Tools

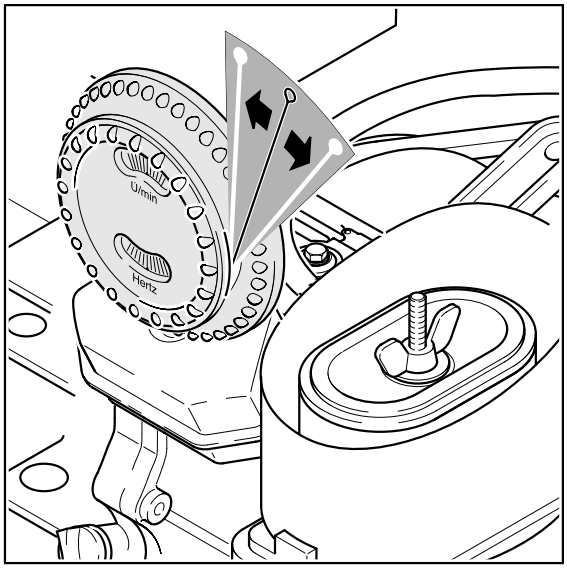


Ignition spark tester, gasoline & LP gas engine

Ignition spark tester (for gasoline and LP gas engine)

Remove spark plug connector from spark plug and push onto spark tester. Connect clamp to suitable conductor (e.g., engine cooling fins). If ignition is in good working condition, cranking engine with starter will produce visible sparks between points of spark tester.

P/N 6.491-359

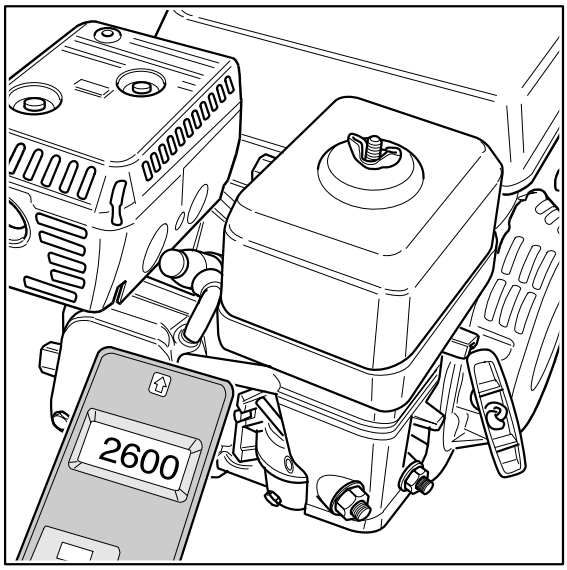


Mechanical tachometer (all engines)

Mechanical tachometer for gasoline, LP gas, and diesel engine

Engine speed is determined by reading engine vibrations. Tachometer is placed at suitable location on engine (e.g., valve cover). When resonance spring is extended until deflection is largest with engine running, scale indicates engine speed.

P/N 6.491-361



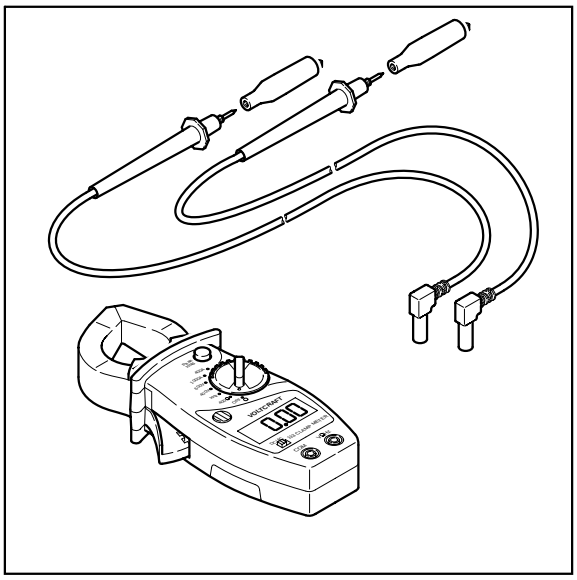
Digital tachometer for gasoline and LP gas engine

Digital tachometer for gasoline and LP gas engine

From a distance of approx. 100 mm (4 in.), point this digital tachometer at spark plug wire, and switch on tester. Set to 4-Stroke (“4-Taktmotor”) position to read speed of running engine.

P/N 6.803-012

Special Tools



Multimeter w/ test probes

Multimeter

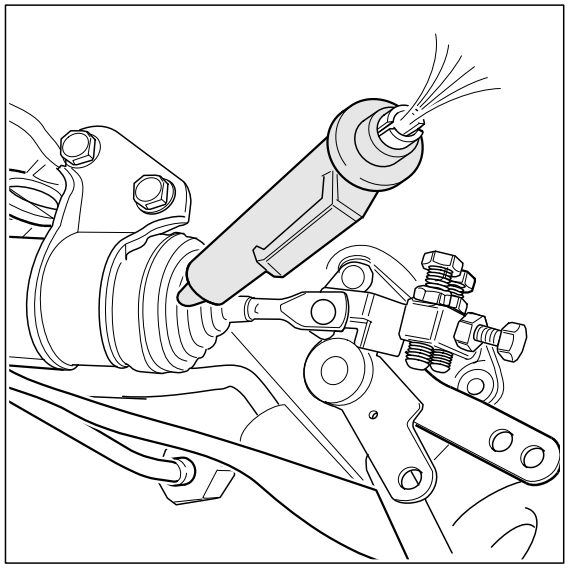
Multimeter must meet the following minimum requirements:

– AC / DC measuring (amps, volts)

– Diode test function

– Resistance measuring (0-15 kΩ)

P/N 6.803-022

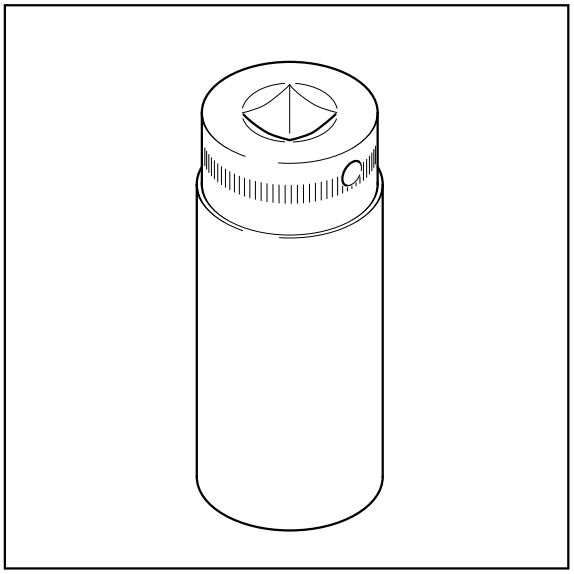


Magnetic field tester

Magnetic field tester

For testing magnetic fields on solenoid valves.

P/N 6.803-003



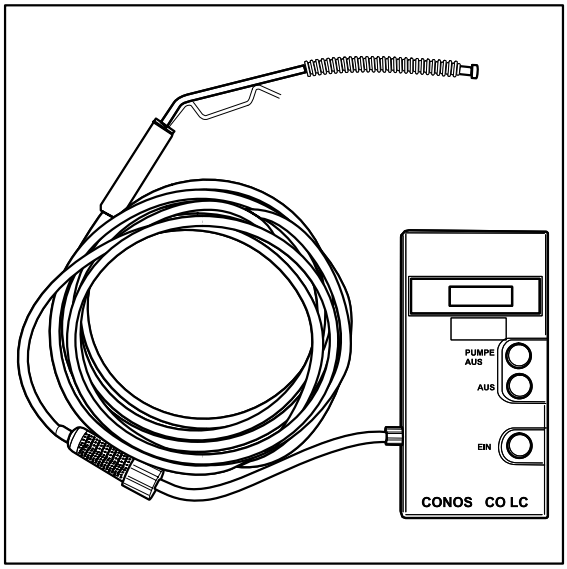
Spark plug wrench for gasoline and LP gas engine

Spark plug wrench
for gasoline and LP gas engine

Unscrews spark plug from cylinder head.

P/N 6.815-088

Special Tools

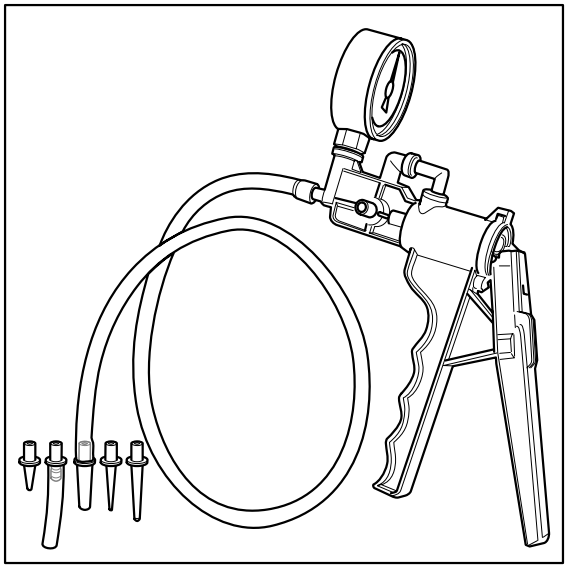


CO Tester for LPG engine

CO tester

Measures CO component in exhaust emissions.

– Measuring range > 2% CO content
– Resolution: 0.01%
– Includes suction pump
– LCD display

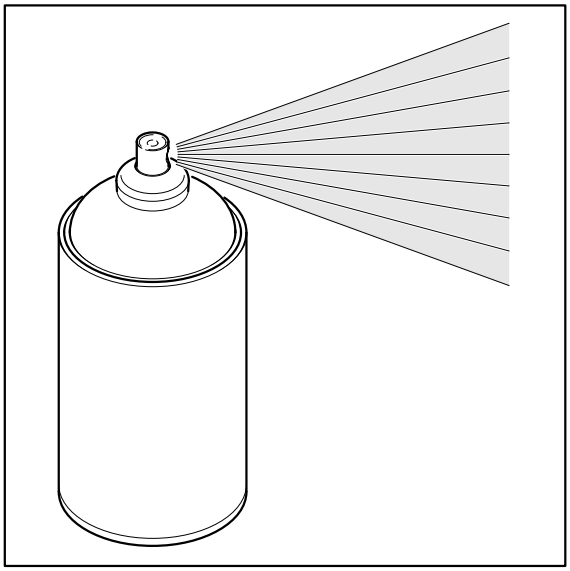


Dual-function hand pump

Dual-function hand pump

For checking integrity of diaphragm in LP gas regulators (LP gas engines). Hand pump features switchover valve to generate vacuum or pressure (Pressure / Vacuum mode).

P/N 6.473-400



Leak detection spray

Leak detection spray (for LP gas engines)

Indispensable when checking LP gas system for leaks.

P/N 6.282-033

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